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General Heading: **BAKER DUPLEX CEMENT GUIDING, FLOATING, CEMENTING EQUIPMENT**

Unit No. A-10

Subject: **Practical Suggestions for Conserving Time, Money and Materials When Landing and/or Cementing Liners**

BAKER OIL TOOLS, INC.

Main Office and Factory:
6000 So. Boyle Ave., Box 127, Vernon Station, Los Angeles, Calif.

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19 Rector Street, New York, N. Y.

Index: 250.1

Date: May 21, 1942

Page: 1 of 1 p.

Baker realizes that oil industry supervision and personnel are today charged with a heavy responsibility . . . specifically, to conserve time and vital materials, *plus* securing *first time* results at a lower cost.

Baker also realizes that to do this you now need, more than ever before, plain facts and practical suggestions as to the equipment you may require or use to achieve these objectives.

Tools and devices bearing the Baker trade-mark have played an important part in the development of the present-day oil industry, and *can* and *will* play a still more important part in helping with the immediate problems at hand.

(Future Baker ads like this one, may not be "fancy," but they will be full of *practical* suggestions as to how Baker equipment can be used advantageously to conserve time, money and materials in your cementing, well repair and well completion work.)

PROBLEM: To economically run, wash-in, wash perforations and/or cement liners.

EQUIPMENT USED: Baker Duplex Cement Wash-Down Whirler Float Shoe, Fig. 3 (or a Baker Duplex Cement Float Shoe); a Baker Circulation Joint, and a Baker Circulation Joint Bottom Sub, Figs. 1 and 2.

METHOD: The Duplex Shoe is made up on bottom of liner. Running-in string is connected to the Duplex Shoe by means of a Circulation Joint and Sub. (This Sub has square, left-hand threads which mate with similar threads in the Duplex Shoe, see Figs. 2 and 3.) The liner is then run to desired point suspended by the running-in string. If desirable or necessary, liner can also be washed in, fluid being pumped down the running-in string and out around the Duplex Shoe. When liner setting point is reached, further washing or circulating can be performed.

If liner is to be cemented, slurry is pumped down the running-in string and out through the Duplex Shoe in the same manner as for circulating or washing. Upon completion of the cement job, running-in string is turned to the right, unscrewing the Circulation Joint Bottom Sub from the Shoe. Running-in string, together with Circulation Joint and Sub, is then pulled from the hole.

For cementing liners off bottom, a fluid by-pass can be obtained by using a *Circulating Type* Bottom Sub with sleeve-covered ports. (Normal by-pass through the Circulation Joint is not possible, as the Joint, when liner is off bottom, cannot be telescoped to permit its opening.) In such applications, following the cementing job, a Tripping Ball is dropped, which seats in the Circulating Type Sub. Pressure is then applied which forces down the sleeve and uncovers the fluid ports, through which circulation can be established.

APPLICATIONS: In addition to the general applications of the Baker Duplex Equipment, there are many standardized procedures followed in certain areas. In one district where packers or testing tools are not adequate, liners are cemented off bottom to test wells before running the oil string. With the liner scab in place, the zone above can be shot, acidized and tested; the Duplex Shoe is then drilled out and the zone below tested with the packer set in the liner. If the well is a producer the casing is run through the liner and cemented in the conventional manner.

In another district, the liner is cemented off bottom to exclude gas or water where the casing has been set too high. Here also, the liner is cemented to blank off an old producing zone for salt water or gas injection in the bottom or top of the zone respectively. In these cases, no perforated liner is wanted in the completed zone to hinder cleaning out production or interfere with salt water or gas injection. The open hole is frequently shot, underreamed or acidized.

ADVANTAGES OF LANDING
AND/OR CEMENTING LINERS
WITH BAKER DUPLEX EQUIPMENT

Baker Duplex Equipment Is Economical
(Save $100.00 to $300.00 per job)

Duplex Wash-Down Whirler Shoes
Will Wash Liners to Bottom

Blank Liners May Be Cemented—
Even When Pressure Is Necessary

Slotted or Screen Pipe May Be Washed—
From the Outside In

Liners May Be Landed On or Off Bottom

No Cement Is Left in Liner

The Liner Stays Where It Is Placed

The Liner May Be Batch-Cemented
When Using a Circulation Joint

With Proper Lap, there will be No Leaks
Between Casing and Liner

(FOR MORE COMPLETE DETAILS ON BAKER DUPLEX EQUIPMENT SEE PAGES 242-246 OF THE 1942 BAKER OR COMPOSITE CATALOG)

Service Note

Competent Baker men will service, make suggestions, and otherwise assist in securing best possible results.

Fig. 1

Fig. 1 (Left)
Product No. 430-L
Baker Model "L" Circulation Joint

Fig. 2

Fig. 2 (Left)
Product No. 431
Baker Circulation Joint Bottom Sub

Fig. 3 (Right)
Product No. 360
Baker Duplex Cement Wash-Down Whirler Float Shoe

Fig. 3

325' of 5½" liner set and cemented by means of Baker Duplex Cement Wash-Down Whirler Float Shoe to blank off open hole through heaving shale in order to permit further drilling. Liner was flush joint to pass through 6" hole with caving walls. Liner worked through tight spots to reach within 25' of bottom; then worked and circulated another 16' where it was cemented with pressure of 1000 p.s.i.

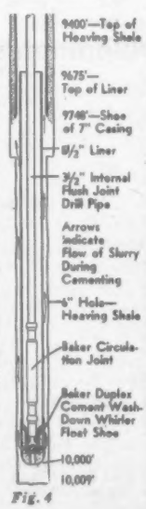


Fig. 4

200' of liner set and cemented off bottom with a Baker Duplex Cement Wash-Down Whirler Float Shoe to provide open hole production from two zones which it separated. String was equipped with a Circulation Type Bottom Sub which permitted circulation for 7 hours before releasing the cementing string from the Duplex Shoe. Cemented with a pressure of 200 p.s.i.

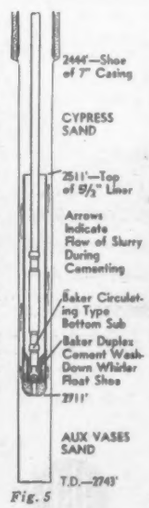


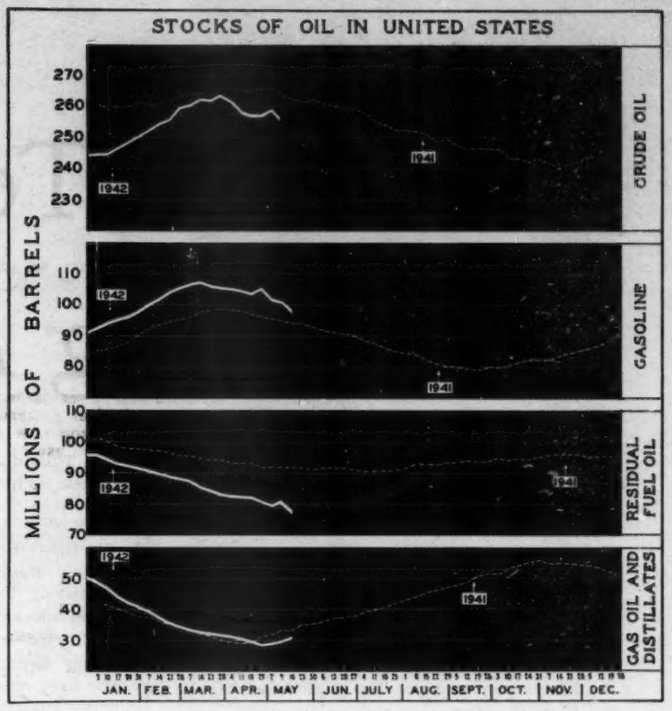
Fig. 5

261' of 5½" liner run in a Baker Duplex Cement Wash-Down Whirler Float Shoe to shut off a leak in 7" casing caused by a split in the pipe. Liner was then cemented with 25 sacks of cement which was pumped through the Duplex Shoe. In such cases where the shoe is on bottom, circulation after cementing is provided by the Circulation Joint alone.

Fig. 6

Trends

Texas Allowables And Rationing In East Being Probed



REACTIONS from the first few days of severe gasoline rationing in eastern and southeastern states and the differences of opinion that have developed between OPC and the Texas Railroad Commission regarding the required oil production in the Lone Star state, have been prominent, newswise, over the past week. In regard to rationing there are developments indicating that the legislative and administrative leaders at Washington now realize that something will have to be done to relieve the petroleum shortage situation in the Atlantic seaboard and Pacific Northwest areas. Additional support for pipe lines of large capacity connecting the East with the petroleum supplies of the Southwest is a certainty. Unfortunately, as pointed out in these columns last week, none of the suggested inland transportation remedies offers substantial immediate relief and that is what is needed. More attention is being given to coastwise tanker shipments and a partial resumption of that service is reported. Eastern suppliers and consumers are hopeful that means will be devised to transport from 200,000 to 400,000 bbl. daily of petroleum from the Gulf Coast pending the completion of a pipe-line construction program parts of which have been authorized but which will require weeks and months to complete.

CRUDE PRODUCTION *3,496,000 bbl. daily average — down 69,440 bbl. One year ago 3,794,405 bbl.*

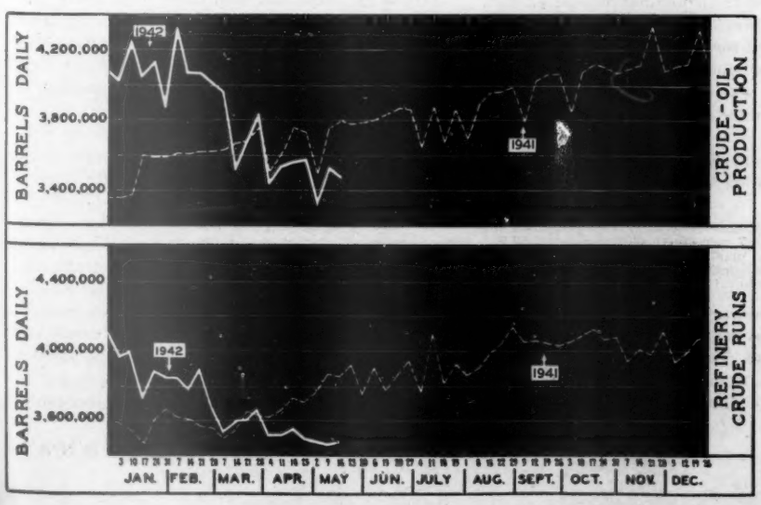
CRUDE STOCKS *255,185,000 bbl. as of May 9—down 3,960,000 bbl. One year ago 263,994,000 bbl.*

GASOLINE STOCKS *99,134,000 bbl. as of May 16 — down 1,516,000 bbl. One year ago 94,286,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *78,826,000 bbl. as of May 16—down 1,329,000 bbl. One year ago 92,020,000 bbl.*

GAS OIL AND DISTILLATES *30,206,000 bbl. as of May 16—up 259,000 bbl. One year ago 33,657,000 bbl.*

REFINERY RUNS *3,484,000 bbl. daily week ended May 16 — up 78,000 bbl. One year ago 3,860,000 bbl.*



DAILY AVERAGE PRODUCTION FOR WEEK

	May 16, 1942	May OPC recommended production	May 9, 1942
Arkansas	71,230	74,000	71,100
California	648,550	673,800	659,750
Colorado	7,560	7,900	7,560
Eastern fields	120,450	123,300	124,050
Illinois	279,385	329,200	315,470
Kansas	261,750	259,300	242,950
Louisiana	303,580	298,600	311,065
North Louisiana	*83,780*	.....	*81,765*
Louisiana Gulf Coast	*219,800*	.....	*229,300*
Michigan	66,700	60,500	64,100
Mississippi	87,430	48,100	89,910
Montana	21,570	25,200	21,690
Nebraska	4,100	4,500	3,750
New Mexico	74,450	73,300	86,470
Oklahoma	388,000	438,500	398,950
Texas	1,067,500	960,000	1,075,850
East Texas	*225,950*	.....	*225,900*
West Texas	*190,500*	.....	*186,200*
North Central Texas	*148,300*	.....	*144,900*
East Central Texas	*78,800*	.....	*79,250*
Texas Panhandle	*80,350*	.....	*82,200*
Texas Gulf Coast	*274,200*	.....	*295,350*
Southwest Texas	*69,400*	.....	*62,050*
Wyoming	93,800	98,300	92,830
Total United States	3,496,055	3,474,500	3,565,495
Total production, Jan. 1-May 16, 1942	544,137,645 bbl.		
Same period last year	492,550,445 bbl.		

In regard to the Texas allowable it is stated by many who have made a study of conditions that actual petroleum demands in that state over the remainder of the month lie between the 960,000-bbl. daily projection of OPC and the 1,402,000-bbl. allowable granted by Texas Railroad Commission. It is pointed out that the federal and state agencies arrive at the allowables from different types of studies. The allowable as established by the state commission is based largely on nominations of buyers who often have a tendency to overestimate their requirements. Due to the confusion that exists in Texas because of the constantly changing conditions in tanker movements from Gulf ports, this method of arriving at total demands is particularly hazardous now. At the same time it is claimed that OPC's estimates are determined by remote studies which do not take into consideration local conditions such as available transportation, and varying conditions in regard to outlets.

The suggested remedy is for OPC officials to work closer with the state regulatory bodies in arriving at the monthly demands for crudes. OPC can give first-hand information regarding national and international conditions which have a bearing on what each state should produce. The state bodies are closer to actual conditions within the fields and can aid in arriving at allowables which will be in line with current demands.

Ickes Raps Texas Commission For Flouting Allowable Order

WASHINGTON, D. C.—Petroleum Coordinator Ickes Monday warned that independent producers and refiners making war products will suffer as the result of the action of the Texas Railroad Commission in setting crude allowables at 1,402,038 bbl. per day instead of 960,000 as he recommended for May.

Last week Mr. Ickes hinted that he could ask WPB for a mandatory order reducing Texas production, but in his statement Monday he made no reference to any possible punitive action. He did hint, however, that the action might break down the system of state and federal cooperation in oil regulation. He said:

"I am disappointed with the action of the Railroad Commission of Texas, especially at a time when it is necessary for both national and state governments and the oil industry to cooperate effectively and wholeheartedly. To rock the boat just now cannot but have serious consequences even to those oil companies that persuaded the Texas commission that the amount of oil allocated for production in that state should be arbitrarily and drastically raised. I anticipate that the officials in Texas who are charged with administering the law, as well as those who produce, refine, and sell petroleum, will be rudely awakened by the facts in the near future.

Cooperation Must Be Mutual

"Such action as this is a serious blow to a war program that, up to this time, has been based on voluntary cooperation in good faith. Cooperation must be mutual; in this particular undertaking it must be plural. Naturally, if such an important state as Texas withdraws from the cooperative effort or refuses to accept a principle that is applicable equitably to all of the oil-producing states, it is to be expected that other states and other oil producers will also follow the course that they mistakenly believe to be in their own interests.

"The petroleum coordinatorship has not been operated in recognition of or to favor a select few. We play no favorites, nor do we play politics.

"I am convinced that the Railroad Commission of Texas will find as a result of this short experiment in inviting an overproduction of almost 500,000 bbl. daily that there will result both increases in storage of crude oil, or its products, which constitute a mortgage on future production, and a refusal on the part of some pipe lines to take all of the oil which the commission has allocated.

"The recommendation made to the Texas commission by the Office of Petroleum Coordinator with respect to the amount of production required from that state was based squarely upon the fact that the dislocation of tanker shipments has rendered it impossible to move more than the total indicated. Production in excess of that amount, to the extent that it is forced into storage, can only result in a loss of necessary flexibility by refiners manufacturing munitions of war, such as explosives and fighting grades of gasoline, so urgently needed by our boys on far-flung battlefronts. This disproportionate taking of oil by pipe lines, such as Texas has already experienced over the past month, can only result in discrimination against many independent producers and thus nullify, in part, the excellent work which the Texas Railroad Commission has heretofore accomplished.

"I feel sure that the Texas Railroad Commission will find it desirable to avoid either of the foregoing occurrences and that as they observe results over the next few weeks, will take appropriate steps to rectify such errors as the facts disclose in subsequent hearings and orders.

"I have the deepest sympathy for the plight of thousands of independent oil operators who are asked to curtail their production as a result of the attacks of the Axis on our shipping, but we ought not to take oil out of the ground when it cannot be moved to where it can be used. My office is making every possible effort to restore the outlets for Texas oil by providing additional means of transporting this oil to the East Coast where it is so badly needed. The oil of Texas is absolutely essential for the winning of this war."

New Allowable 442,038 Barrels Higher Than OPC's Quota

AUSTIN, Tex.—The Texas Railroad Commission last week pulled further to the left of the federal Government's petroleum-production recommendations issuing an allowable order for the last half of May permitting yield of 1,402,038 bbl. daily. The allowable is 442,038 bbl. daily higher than the quota certified by the Office of Petroleum Coordinator.

Thus, Texas became the first oil state with an effective regulatory body to deviate substantially from the production quotas of the Office of Petroleum Coordinator for War. Mississippi production has continually exceeded the OPC recommendation but the state lacks statutes covering petroleum conservation and, by comparison with Texas, is a small factor in total crude output.

Before issuing the allowable order for the last half of May, the commission held an interim hearing and checked purchaser nominations previously submitted. Nominations, according to Jerry Sadler, member of the commission, amounted to 1,412,750 bbl. daily.

Sadler Calculates Production

"The order," declared Mr. Sadler, "is based on what we considered firm nominations under oath at the emergency hearing. This order will supply all the crude needed for making aviation gasoline. It will fill all pipe lines going out of the state without having a select crowd which has been the beneficiary under the recommendations of OPC."

Commissioner Sadler's breakdown of the allowable for the last 16 days of May is as follows:

	Bbl. div.
Average crude production	1,376,805
Underproduction at 6.7 per cent	92,212
Probable daily crude production	1,284,593
Natural gasoline and condensate	117,945
Probable net production	1,402,038

There is no separate classification of fields in the new order, leaving all areas on an operating schedule of 13 days. Three shutdown days specified were May 16, 17, and 18. In previous orders since April, the commission had given special consideration to fields designated as productive of crude particularly desirable for refining aviation gasoline and other war products.

When it became certain that the commission intended to ignore the OPC production recommendation for the entire month, Coordinator Ickes said in Washington that he might ask for a compliance order from the War Production Board.

Commission Asked Hearing

Advised of the coordinator's comment at his press conference, the commission wired Donald M. Nelson, director of the WPB, as follows:

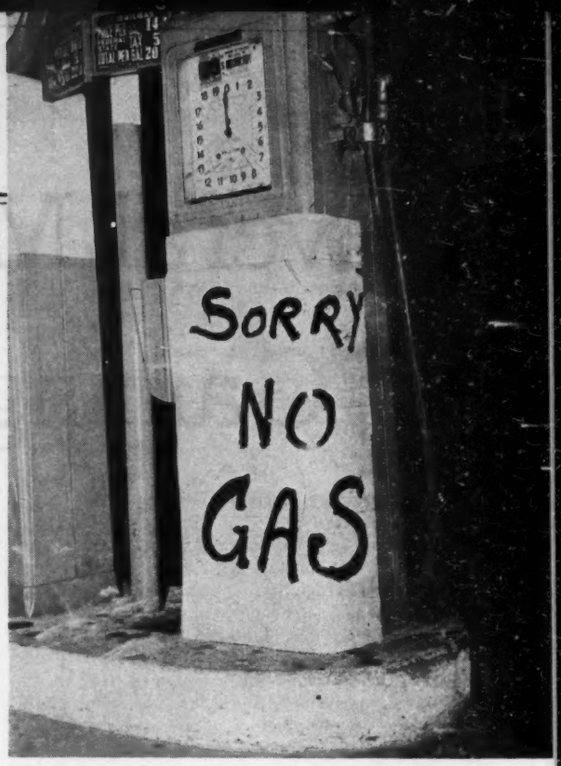
"The Railroad Commission of Texas heard testimony under oath on May 11 that purchasers of crude oil in the State of Texas who have the responsibility for refining oil for vital war necessities need 1,400,000 bbl. of oil daily for the month of May. Petroleum Coordinator Ickes has recommended 960,000 bbl. daily production. In the event Coordinator Ickes requests the War Production Board to take action on this matter, we respectfully request the War Production Board to allow us to present the position of the Texas Railroad Commission in this vital war problem."

Stocks of Texas crude oil have risen nearly 10,000,000 bbl. since Pearl Harbor, increasing from 83,741,000 bbl. on December 6, 1941, to 93,769,000 bbl. on May 9, in Bureau of Mines estimates. Considering the low point of Texas' crude storage in the past 5 months which was 81,676,000 bbl. on December 13, 1941, the rise has been more than 12,000,000 bbl. The recent high of Texas crude stocks was reported April 4 when 96,918,000 bbl. were in storage.

At the emergency hearing early last week, Commissioner Culberson said Texas contained 50,000,000 bbl. of empty storage which, he declared, was ample cushion for a higher rate of operations that would permit the small refiners adequate crude supplies in their local areas and at the same time enhance the industry's position to meet war demands.

Representatives of various pipe-line companies

This Week...



THE FINAL RUSH OF EASTERN MOTORISTS TO FILL THEIR TANKS BEFORE DIRECT CONSUMER RATIONING STARTED LAST FRIDAY CAUSED NUMEROUS SIGNS LIKE THIS TO APPEAR IN DENSELY POPULATED AREAS. FOR THE FIRST TIME IN THE GASOLINE ERA THE INDUSTRY WAS UNABLE TO ACCOMMODATE ALL COMERS AND THEN THROUGH NO FAULT OF ITS OWN.

Texas Railroad Commission refuses to follow production quota of OPC. Sets allowable nearly 450,000 bbl. per day higher than federal recommendation for last half of month.

●

Tank-car shippers take grievances to Washington. Chief complaint is prohibition on use of equipment for hauls less than 100 miles. Liquefied petroleum gas manufacturers can find no unused alternate transport.

●

Texas crude-oil stocks about 12,000,000 bbl. above recent low mark recorded in mid-December. Recent fluctuations have been modest. Most accumulation occurred in January and February.

●

Confusion rampant in East as consumer gasoline rationing ends first week. Congressional leaders taking interest in situation. Conditions discussed with president.

●

Two congressional committees start study of how rationing will effect economics in East and more specifically what influence it will have on morale and war productivity of civilians.

●

OPC submits detailed data on steel requirements for Texas-New York pipe lines and segments thereof. Six projects dependent mostly on reclaimed pipe given approval, some now under way. Three requiring chiefly new steel uncertain. WPB basically opposed to diversion of steel. Weight of political pressure, opinions of disgruntled motorists, slowup of war production yet to be determined.

●

Privileges of Preference Rating Order P-98 extended until July 1. New procedure under study after that. Some system of allocation seems likely, possibly with emergency exceptions.

●

Coordinator Ickes hints at politics, declares Texas and the state's oil industry will be chief sufferers. Failed to ask WPB for enforcement order. Commissioners Sadler and Culberson asked Donald Nelson for hearing if such request was made.

●

Basic Preference Ratings Plan, Form PD-25, simplified for small industrial units, requiring less book work. Abbreviated Form PD-25X abolished.

●

Campaign launched to call petroleum shortage by true name. Such as: transportation shortage, rubber shortage or spending conservation.

●

Natural-gasoline manufacturers told to take more aggressive part in producing war materials. Warned that synthetic-rubber parade is forming, time for joining short.

●

Army engineers support barge canal and 24-in. pipe line across Florida, to feed Inland Waterway.

reported their current runs and capacities at the commission's emergency hearing. The difference between runs and capacities shown in the following tabulation is not as much as indicated for most of the carriers are obligated to pick up additional oil beyond the state line which is not, in all instances, accommodated by supplementary capacity.

Company—	Bbl. daily Current runs	Capacity
Arkansas Pipe Line Co.	11,569	30,000
Atlantic Pipe Line Co.	(*)	(*)
American Liberty	(*)	(*)
Aloco Pipe Line Co.	(*)	(*)
Bell Oil & Gas Co.	2,274	7,200
Cities Service	5,599	.....
Gulf Refining Co.	13,239	55,000
Humble Pipe Line Co.	49,338	75,000
Magnolia Pipe Line Co.	42,500	52,000
Phillips (products)	30,558	34,000
Sinclair Prairie Pipe Line Co.	35,787	40,000
Shell Pipe Line Co.	47,690	48,000
Stanolind Pipe Line Co.	44,895	55,000
Texas Pipe Line Co.	16,890	16,000
Bell Western	1,271	5,000
Tex.-Ark.	3,648	.....

*Unreported.

●

OPA Working on National Gasoline-Rationing Plan

WASHINGTON, D. C.—It was learned on good authority today that OPA is actively working on plans for a nation-wide system of gasoline rationing.

It is understood that plans are so far advanced that the system could be put into effect throughout the country July 1, the date when a permanent system is scheduled to be launched in the eastern area now under temporary rationing system.

OPA could not institute rationing in other areas without a formal directive from WPB, but as Price Administrator Leon Henderson is a member of WPB it is thought he could obtain such a directive as soon as details of the rationing plan are completed. Mr. Henderson has stated publicly that nation-wide gasoline rationing may be necessary to conserve tires, and all WPB officials are seriously concerned over the rubber supply. The Office of Defense Transportation also has hinted that tire conservation might be enforced by gasoline rationing.

Several members of Congress today expressed opposition to rationing in areas where there is no gasoline shortage, a circumstance which may indicate advance knowledge that nation-wide rationing is definitely planned by high administration officials.

At his press conference Tuesday President Roosevelt said nation-wide gasoline rationing has been discussed but that he sees no reason for it unless it is necessary to save tires.

He said the oil shortage should be treated as a national problem requiring a sort of pooling of tank cars and trucks, and that while areas in oilfield and refinery centers and those receiving oil directly from pipe lines need not be restricted, other areas now served by tank cars and trucks may have to be curbed in order that the tank cars may be shared with regions entirely dependent on them. He added that this is not a matter to get terribly excited about and that a rule of reason should be applied and some process of equalization worked out.

The president said that the administration is looking into every angle of the eastern oil shortage, including resurrection of the old proposal for a big pipe line from Texas, a trans-Florida line, additional barges, and rearrangement of old pipe lines. He would not say whether or not steel should be spared from other uses to build the big line but said it would take a lot of steel and that there is not enough to build a fleet of barges.

Humble Resumes Allowable Purchases in Southwest Texas

HOUSTON, Tex.—Effective May 16 and continuing until further notice, Humble Oil & Refining Co. resumed the purchase of current allowable production from all properties to which it is connected in Southwest Texas.

Humble reduced purchases to 50 per cent of allowables at all Southwest Texas connections May 2.

A. I. Henderson Made Chief Of WPB Materials Division

WASHINGTON, D. C.—A. I. Henderson, formerly deputy director, has been made director of materials of the War Production Board, succeeding William L. Batt. In announcing Mr. Henderson's appointment, Mr. Batt explained that the pressure of his many duties has been such that he has been forced to withdraw more and more from actual administration of the Materials Division and that Mr. Henderson has been performing most of the director's duties for several months.

Federal Agencies to Absorb Increased Tanker Charges

WASHINGTON, D. C.—OPA and War Shipping Administration jointly announced a plan of subsidy for tanker shipments of petroleum. WSA will assume all costs above maximum charter rates established January 20.

The plan is retroactive to April 20 when vessels were requisitioned or chartered by WSA. The plan applies only to tankers of more than 3,000 gross tons.

Several Months' Delay Likely In Gaining Pipe-Line Relief

By J. P. O'DONNELL

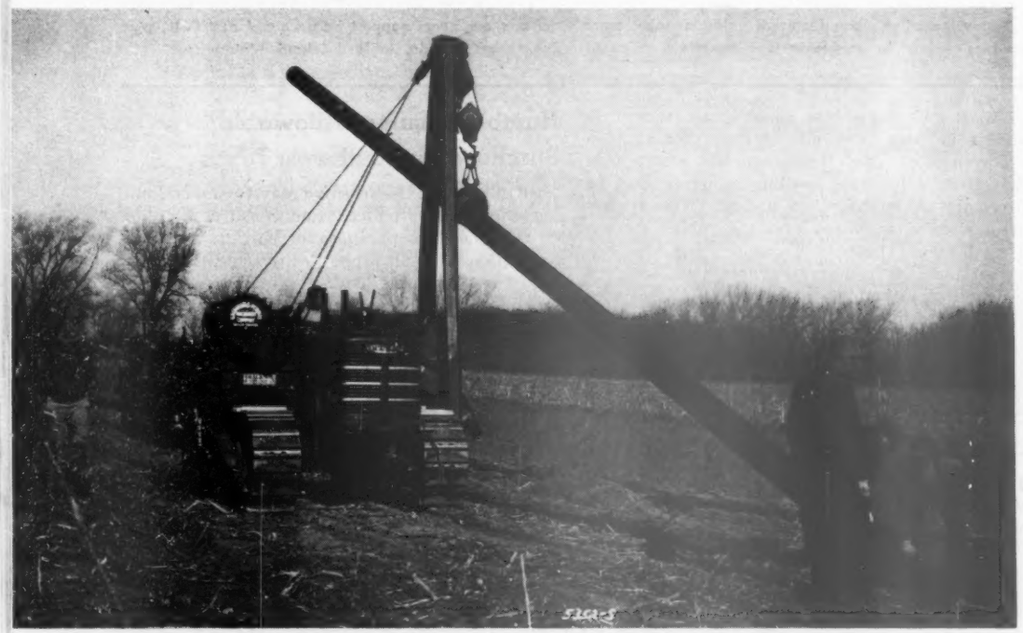
NEW YORK.—It will be late summer or early fall before the revamping of the country's pipe-line system will begin to provide relief for the East Coast shortage area according to present expectations. Inability to obtain sufficient pipe, reclaimed as well as new, has necessitated revision of the original plans and has resulted in the scrapping of several of the less economic plans. Work will be under way on at least two of the remaining projects within a few weeks but it will be several months before either is completed.

First of the projects to get under way and likely the first to be completed will be the 150-mile, 10-in. products line from El Dorado to Helena, Ark. This line will deliver 50,000 bbl. of refined products daily to Helena, whence it will be taken either by barges or by tank cars to District 1. Consideration has been given to crossing the Mississippi at Helena in order to facilitate rail shipments but the expense is great.

Termination of a number of pipe lines in the vicinity of El Dorado makes it an ideal point for beginning an extension. The extension would be served by the existing lines of the Gulf, Magnolia, Texas and Arkansas Pipe Line systems. The now-unused Grand Lake system of the Standard Oil Co. of Louisiana would provide one-third of the necessary line while the remainder would be obtained from the 245-mile Magnolia Pipe Line Co. from the Texas Panhandle.

Work is expected to begin soon on the extension of the Plantation pipe line from Baton Rouge, La., to Beaumont, Tex. This will also be a 10-in. line and it will have a capacity of 60,000 bbl. per day. Pipe for this line will be obtained from the Pure Oil Co. Van-Smith's Bluffs, Tex., line. Eight stations would be required on this line and lack of sufficient pumping units was a factor that delayed this undertaking. The proposed line from Baytown to Beaumont, Tex., has been abandoned since there is sufficient refining capacity in the latter area to supply the planned increased capacity of the Plantation system.

Fourteen new stations will be added to the Plantation system to increase the capacity from 60,000 to 90,000 bbl. per day on the 12-in. line segment from Baton Rouge to Bremen, Ga., and from 42,000 to 63,000 bbl. per day on the 10-in. line from Bremen to Greensboro, N. C., present terminus. These stations will be equipped with motor-driven centrifugal pumps. Extension of this line from Greensboro to eastern Virginia probably will not be undertaken until the capacity of the line has been increased. Locating of this proposed extension west of Richmond, Va., in order to avoid the congested Norfolk area is believed to be under consideration.



Mid-Continent pipe-line construction operations, such as this, have increased interior capacities and will fit into the projects to link inland facilities with the East Coast consuming and refining centers

Continued decline in Illinois production may defeat the project to increase the movement of Texas crude to the northeast since it has resulted in the capacity operation of all available lines to supply District 2 refineries with crude from the Southwest. However, it is probable that work will proceed on the eastern end of this project, extending present facilities eastward from Lima, Ohio, to Negley station on the Pennsylvania-Ohio line, western terminus of 544-mile Tuscarora Pipe Line system which would transport oil to Bayonne, N. J.

The proposed trans-Ohio line would be 152 miles long, 8 in. in diameter and would have a capacity of 25,000 bbl. per day. It is possible that 90 miles of the line will be constructed with pipe reclaimed from the now idle trunk line of the Illinois Pipe Line Co. to Latonia, Ky., while the rest may be constructed of rejected and unused casing and new pipe. The erection of new pumping stations would be required on the Tuscarora line and it is estimated that the reversal of this line could be accomplished within 6 months. This would release tank cars now delivering 25,000 bbl. of Illinois crude daily to District 1 refineries.

One project that may be abandoned is the 6 or 8-in. line proposed from Fostoria to Akron, Ohio, which would supply the Susquehanna line. The 100-mile line was projected to carry 15,000 bbl. of refined products to the western terminus of the Susquehanna line which would be reversed to deliver the products into District 1. However, it is believed that products could be barged from Toledo to Cleveland and the reversed Susquehanna line supplied in this manner without entailing pipe-line construction.

Gasoline Lines Reversed

Work is also going forward on the plan to utilize the Keystone and Socony-Vacuum lines which have terminals at Buffalo, N. Y. The Socony-Vacuum line could be tied in with the branch of the Susquehanna line which normally serves Central New York. Very little construction work other than the installation of new pumping equipment would be required. However, the difficulty in getting products to these lines is a major problem. It has been suggested that barges be removed from the so-called "upper lake" area and that the Wisconsin area be supplied by tank car and tank truck. Included in this project was the reversal of the Keystone line across Pennsylvania. This has already been accomplished and the line was scheduled to begin the delivery of 20,000 bbl. of crude oil per day last week.

The proposal to convert a 12-in. line from East Texas from crude to refined products and extend it to Paducah, Ky., has been changed with Cairo, Ill., having been selected for the eastern terminus. Cairo was selected because it would provide a better loading terminus and would also reduce construction. One of the crude lines now supplying Houston area refineries with East Texas oil would be converted, possibly the new Pan American line. The extension to Cairo would require 455 miles of 12 and 14-in. pipe and would have a capacity of 90,000 bbl. per day. Difficulty in obtaining the necessary pipe is holding up this project though it is considered one of the most desirable of those under consideration. Digging up and relaying of six pipe lines ranging from 6 miles to 160 miles in length is being considered. Difficulty in obtaining necessary pumping equipment is also a barrier to this project.

Projects which have definitely been abandoned include the 20-in. crude-oil line from East Texas to Salem, Ill. It was planned to extend this line later to Philadelphia, Pa. The original proposal embraced a line of 550 miles in length with a

capacity of 200,000 bbl. per day. Since 114,000 tons of steel and all new equipment would be required for this line, it has been considered a virtually impossible objective.

Another project which may be abandoned is the Memphis-Tinsley, La., line. This proposed 250-mile, 10-in. line would have had a capacity of 25,000 bbl. per day. Lack of pipe and the fact that it would not have materially reduced the tank-car haul from the Tinsley field to the East Coast resulted in its abandonment.

Abandonment of the East Texas-Salem line also means abandonment of the plan for a Salem-East Coast line since the latter would have been dependent on the former. The Salem-East Coast line was planned as an 850-mile 20-in. carrier that would have had a capacity of 200,000 bbl. of refined products daily.

OPC Submits Report on Steel Needed for Three New Lines

By HENRY D. RALPH

WASHINGTON, D. C. — A detailed report on new steel requirements for three pipe-line projects recommended by the Office of Petroleum Coordinator this week was submitted to the War Production Board.

Preparation of the report and decision of OPC to reopen the steel-supply question with WPB does not necessarily mean that prospects for approval have improved. However, OPC is still convinced that the large-diameter lines from Texas to the East Coast are necessary for assuring a supply of military petroleum products and as much of the reasonable civilian demand as possible. These duties were clearly passed to OPC when the coordinator's office was created, although determination of the most judicious use of strategic materials was entrusted to WPB.

If WPB sees fit to deny the frequently renewed pleas of OPC for steel with which to build the necessary lines, theoretically both agencies have fulfilled their respective duties.

Practically all requests of the OPC for new pipe-line steel and pump-station equipment have been turned down in the past. The industry and OPC, however, hope that steel will be granted to make a start on the western end of the Texas-New York project. To this end, the engineering data have been combed carefully for all possible savings of steel, and by various devices, such as reducing the thickness of pipe in some sections, ways have been found to reduce the total requirements.

The OPC has given formal approval to nine pipe-line projects, including three that require virtually all new material. OPC Recommendation 49 lists the projects and provides for a temporary joint pipe-line engineering subcommittee and a temporary joint pipe-line management subcommittee. Both temporary committees are to function under direction of chairmen of Districts 1, 2 and 3.

The nine projects included in Recommendation 49 are described in general terms only, the details to be worked out by the subcommittees, a system of organization which accounts for conflicting bits of information from various sources within the industry.

The general plan for increasing pipe-line delivery of petroleum to the East Coast was published in The Oil and Gas Journal April 23, Page 20. At that time an 8-in. crude line from the Tinsley field in Mississippi north to Memphis, Tenn., was included in the program. This project has been abandoned and was not included among those approved by OPC in Recommendation 49.

Meanwhile, congressional leaders showed a more active interest in the petroleum-supply situation, probably an outgrowth of consumer rationing on the East Coast.

Sen. Alben W. Barkley, Kentucky, Senate majority leader, after discussing the eastern petroleum shortage with President Roosevelt Monday, said that revised plans for constructing pipe lines will be studied by the Government at once. The investigation, Senator Barkley said, will be made by the Department of the Interior, WPB and the Reconstruction Finance Corp.

Speaker of the House Sam Rayburn, Texas, said that the weekly conference of legislative leaders at the White House Monday discussed at great length the problem of transporting more oil to the East Coast. He said that "the quickest way of getting oil to the East would be looked into at once."

Restraint of the two congressional leaders in taking an unqualified stand for constructing large lines from the producing centers of the Southwest to the East Coast may be a significant point. It appears doubtful that the necessary steel allocation for really effective new projects had received favorable consideration in the regular White House conference.

Pipe Line and Canal Across Florida Supported by Army

WASHINGTON, D. C.—Both an oil pipe line and a barge canal across northern Florida were urged by Maj. Gen. Eugene Reybold, chief of Army engineers, at a hearing Monday before the House rivers and harbors committee on a bill for immediate construction of the canal.

General Reybold said the canal would take 2 or 3 years to build but the pipe line could be in use in 6 months. He recommended a 24-in. line to carry 250,000 bbl. daily, from Carrabelle, near Port St. Joe, to Jacksonville, about 185 miles. Estimated cost is $10,000,000.

Confusion Widespread Among Rationed Eastern Motorists

WASHINGTON, D. C.—The first week end of gasoline rationing in the East brought a marked reduction in motoring but continued confusion over uses which might be made of cars having B and X ration cards.

Following OPA instructions to local rationing boards to make public lists of holders of B and X cards, and announcement of some local rationing officials that they would investigate nonbusiness driving, many persons rushed to exchange their cards for others with fewer coupons. At the same time, rationing boards began receiving applications for supplemental ration cards. It was expected to be some time before an analysis could be made of the types of cards issued in the rationing area in order to make an estimate of the amount of gasoline which they cover.

In spite of reduced motoring, many filling stations were unable to meet demands due to the 50 per cent curtailment in deliveries which went into effect May 16 through Amendment 2 to WPB Limitation Order L-70. At the same time Revised Order L-56 made a similar reduction in fuel-oil deliveries.

Details of the 50 per cent fuel oil curtailment order that primarily affects East Coast and Pacific Northwest consumers were announced last week.

Curtailment will be made on deliveries of fuel oil used for space or central heating, cooling equipment, and water-heating equipment, in domestic and commercial establishments.

The order also bans deliveries of fuel oil for use in new or converted oil burners in 15 midwestern states, if the new burner is installed after June 15, 1942, or a burner is converted after June 1.

Recommended by the Office of Petroleum Coordinator and issued by the War Production Board (as an amendment to Limitation Order L-56), the order became effective May 16.

While reduced deliveries are in effect during the summer, increased quantities of fuel oil will be shipped into the restricted areas in an effort to build up the depleted stocks sufficiently to meet next winter's requirements.

Three areas have been defined in the order:

Area 1 is identical with the new gasoline-curtailment area, consisting of Oregon, Washington, the District of Columbia, and the 17 East Coast states, except 93 counties in western New York, western Pennsylvania, western Maryland, western Virginia, and almost all of West Virginia.

Area 2 consists of 15 midwestern states: Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.

Area 3 includes Oregon, Washington, the District of Columbia, and all of the 17 East Coast states.

Details of the order include the following:

Fuel oil is defined as grades 1, 2, 3, 4, 5, and 6, and Bunker C, kerosene, range oil, gas oils, and any other liquid-petroleum products used for heating purposes.

A 50 per cent reduction was ordered in deliveries of fuel oil for use in space or central heating and cooling equipment in domestic and commercial establishments in Area 1.

A 50 per cent reduction in Area 1 was also ordered for deliveries of fuel oil for use in domestic and commercial water-heating equipment, which is defined as that used to heat water in homes, apartments, hotels, office buildings, dormitories, restaurants, theaters, or buildings used for recreation purposes.

The percentage of reduction will be based on deliveries made during the corresponding month in 1941. However, adjustments will be made up-

ward or downward, if 1941 deliveries were abnormal, so that deliveries will be 50 per cent of what would normally have been made.

No fuel oil may be delivered in either Areas 2 or 3 for use in new oil burners installed after June 15. However, if the installation of an oil burner is specified for a new construction, deliveries may be made provided that the foundation under the main part of the building was completed before April 13 in Area 3 and before June 15 in Area 2.

This exception for construction work already begun was made so that a contractor would not be compelled to rip up a completed foundation to install some facility other than a fuel-oil burner.

Similarly, fuel oil will not be delivered for use in converted oil burners unless the conversion was completed before March 24 in Area 3, and before June 1 in Area 2.

The order provides, however, that fuel oil may be delivered both in Areas 2 and 3 for use in newly installed or converted oil burners if the consumer cannot use a fuel other than fuel oil, electricity, natural gas, or mixed natural and manufactured gas either because a substitute fuel is not available or technical factors prevent the use of a substitute fuel.

No deliveries of fuel oil will be made anywhere in the United States for use in coal-spraying equipment. This will eliminate the common practice of spraying fuel oil on soft or other coals to reduce dust hazards.

More Severe Rationing Is Timely in Northwest

By L. P. STOCKMAN

LOS ANGELES, Calif. — The War Production Board's order restricting deliveries of gasoline in Oregon and Washington to 50 per cent of normal becomes effective June 1 and during the interim sales will remain on the basis of 33⅓ per cent reduction. The order reducing distribution to 50 per cent of normal may be followed later with a more drastic limitation in Washington and Oregon. Disrupted transportation facilities will not permit California marketers to supply all requirements of the Pacific Northwest without use of tankers.

California operators have started a campaign to eliminate the so-called gasoline shortage by designating it as a transportation shortage instead and there is considerable merit to the movement because gasoline will be flooding many refineries unless something is done to reduce the production of light crude oil.

Depends on Rubber Action

Considerable thought has been given to the possibility of injecting gasoline into subsurface reservoirs. It all depends upon what action is taken with respect to rubber. If all automobiles except those in public use are removed from the roads by one method or another a substantial part of all gasoline produced would accumulate in the tanks of refiners. Injection of surplus gasoline into oil sands would prove the most feasible way of removing it from tanks at refineries but the operation is not very practical.

Injection of refinery gasoline into oil sands should increase production of crude oil from the sand into which it was injected and would probably increase the gravity and step up the ultimate recovery. Obviously if the California industry is forced to inject gasoline into an oil structure prices for light crude might be reduced. Before this period was reached it is quite likely that the Conservation Committee would force a shutdown in fields producing light crude oil. Injection of gasoline into subsurface oil sands, therefore, would appear to be some time away. There are not very many fields in California in close proximity to refining centers that could be used as storage space for excess gasoline as a prime requisite would be the existence of a porous sand and close ownership of acreage so that it would not migrate to another's property.

The Kern County Chamber of Commerce lost its fight for a synthetic-rubber plant in that district as it has been informed by the president of Rubber Reserve Co. in Washington that the first of several plants will be erected in the Los Angeles area. The reason given is that stock for the manufacture of the raw material is available in the Los Angeles district in ample quantity and secondly that those who will operate the plants already have refineries in the southern part of the state. There has been very little action on the synthetic rubber question due to priorities, but construction of initial plants is expected to get under way within the next few months.

Production Requirements Plan Forms Are Simplified

WASHINGTON, D. C.—A revised form of application for priority assistance under the Production Requirements Plan to be used for the third quarter of 1942 was announced last week by J. S. Knowlson, director of industry operations.

New instructions to applicants for preference ratings under the PRP will allow them to omit a considerable part of the information which has previously been required. Users of materials will also be able to supply the same reports on PRP applications which they are now preparing in answer to the general metals questionnaire, Form PD-275, and duplication of paper work will thus be avoided.

The new instructions will simplify the preparation of PRP applications by the many additional companies which must begin operating under the PRP in the quarter starting July 1. In accordance with policy recently announced, most of the limited blanket ratings under which preference ratings have been assigned on an industry-wide basis will be revoked or allowed to expire, and companies which have been using the blanket ratings will be required to apply under PRP.

To assure fair and uniform treatment of applicants under PRP, specific directions for assignment of ratings in accordance with the importance of various products in the war and civilian economy are now being prepared by the industry branches of the War Production Board. These directions will specify the grade of ratings—A-1-c, A-3, etc.—which should normally be granted for the use of each industry or type of production, and will indicate the policy to be followed in determining the amounts of materials to which such ratings may be assigned in each case.

These processing directions will be made public from time to time as they are ready for use. This will enable producers to know just where they stand with respect to priorities, and will assure uniform treatment for all firms handling the same type of war and essential civilian production in each industry.

Assignment Depends on Product

Under the new program, assignment of ratings to PRP applicants will depend increasingly on the nature and use of the applicant's product, less on the pattern of preference ratings on the orders which he has on his books. For example, high ratings will be assigned to a manufacturer of parts which would ultimately be incorporated in military planes or tanks, without his having to prove than 75 per cent of his orders were A-1-a, 15 per cent A-1-b, etc.

For the present, the revised PD-25A application form for the PRP which was prepared for the April-June quarter will continue to be used, but the instructions specify that many of the columns may be left blank. These instructions are now available in War Production Board field offices, and applications on the simplified basis will be accepted, effective immediately.

Specific changes in the use of Form PD-25A, as outlined in the new instructions are as follows:

1. In *Section B*, the reports of shipments in the most recent 3 months for which figures are available no longer need to be broken down by preference ratings; only total shipments must be reported. Specifically, the applicant will no longer be required to fill in Columns 6, 7, 8, and 9 under *Section B*.

2. Reports under *Section C*.—Inventory reports covering classes of products included in *Section B*—are eliminated entirely.

3. Under *Section D*, the column headed "Unfilled Orders" must be changed to "Orders Scheduled for Shipment During Quarter." This will enable the War Production Board to obtain a more accurate picture of the immediate materials requirements of the applicant, and assign proper ratings to him on the basis of his production schedule for the calendar quarter, rather than on the basis of all unfilled orders on his books, some of which may bear low-preference ratings and be deferred for a considerable length of time.

4. In *Section E*, applicants will hereafter disregard Columns 4 and 5, covering "Inventory Beginning of Quarter" and "Received During Quarter." Under "Statement for Quarter Ending ..... (most recent 3 months for which figures are available)" they will fill in only Columns 6 and 7, in which they report past use, and inventory at the end of the quarter.

The heading of Columns 8, 9, 10, and 11, covering anticipated requirements, should be changed from "Quarter Ending June 30, 1942" to "Quarter Ending September 30, 1942," or the closing date

of any calendar quarter for which the application is submitted.

The heading of Column 10 under *Section E*, now "Leave Blank" should be changed to "To Be Received During Quarter." In this column the applicant will report his requirements of new materials to be received from his suppliers during the quarter; the difference between Column 8 and Column 10 will represent the amount of materials which he can take from inventory.

A new and simpler classification list for metals, showing the form in which they are to be reported in *Section E*, accompanies the new instruction sheet. This classification list conforms with the list used on the general metals questionnaire, Form PD-275, and is to be substituted for the classification of metals now contained in Materials List No. 1 of Form PD-25A. Other materials are to be reported in *Section E* in accordance with Materials List No. 1, as before.

5. Changes in *Section F*, on which applicants report inventories and requirement of materials not contained in Materials List No. 1 or in the metals classification, are exactly the same as the changes to be made in *Section E*—Columns 4 and 5 will be disregarded, and in Column 10, the applicant will report the dollar value of receipts of such materials which he needs to fill his requirements during the quarter.

6. Under *Section G*, applicants may now also include requirements for minor capital items. However, such capital items must be directly concerned with plant operations, must not include office machinery or any machinery for addition to or expansion of existing facilities, and must not include machine tools or large equipment items.

7. *Section E and F Supplement*, in which anticipated requirements are broken down by classes of products produced, must hereafter be filled in by all applicants under the Production Requirements Plan. However, this section now becomes in fact a supplement to *Section E* only; the report should include only anticipated requirements of materials listed in Materials List No. 1 or in the metals classification list, and must not include other materials reported in *Section F*. Consequently, the totals of the quantities entered in the anticipated requirements columns—Columns 12, 14, 16, and additional columns if necessary—must equal the requirements of each material reported in Column 8 of *Section E*.

Elimination of the figures previously required on Form PD-25A in the columns which have now been cancelled will mean that applications will be rated in the War Production Board to an increasing extent on the basis of the importance of the applicant's products or the end use of his products, and less consideration will be given to existing pattern of preference ratings on his orders.

This constitutes a further step toward use of the Production Requirements Plan as a method of allocating specific quantities of materials to producers on the basis of the importance of their operations in war and essential civilian production.

P-98 Continued 45 Days But Further Extension Unlikely

PRIVILEGES of Preference Rating Order P-98 were extended to the petroleum industry until July 1 by the War Production Board last week but there will be a new procedure for obtaining repair and maintenance materials after that date.

In extending the life of P-98, the WPB prefaced its formal order with the explanation that "a new procedure for granting preference ratings to the petroleum industry is now being studied and will be announced before July 1."

The order was originally issued with a limitation date of May 15 and the WPB waited until May 14 to announce the 45-day extension. Justine Wolfe, attorney for the Office of Petroleum Coordinator, who spoke in Tulsa last week before the Natural Gasoline Association of America, said that an allocation system was probable after July 1.

Many of the blanket or limited preference ratings, designated as P orders, have been discarded in the past few weeks. In their places, the WPB has converted most industries using strategic materials to the Preference Ratings Plan which requires quarterly compilation of requirements on Form PD-25.

Preference Rating Order P-98 was issued almost simultaneously with Conservation Order M-68. The two are complementary in that M-68 restricts the uses to which material can be put by the petroleum industry and P-98 provides the medium through which to obtain the equipment authorized by the basic order.

Without P-98 at disposal of the petroleum industry, it is anticipated that operators will need to make a more careful analysis of their material requirements, both actual and anticipated, in order to take care of contingencies which might arise during a period of 3 months.

Latin-American Countries Given High Priority Rating

WASHINGTON, D. C.—Exports of critical materials to the other American republics, within the limitations of specific allocations by the requirements committee of the War Production Board, will be given preference over other orders for such materials, to the extent necessary to meet delivery schedules set by the Board of Economic Warfare and WPB, it was announced last week by the director of industry operations.

General Exports Order M-148 provides that when an order for any material listed in an accompanying schedule is served on a producer, together with an export license for such material issued by the Board of Economic Warfare, the order must be filled on the delivery date specified in the license, regardless of any other orders bearing high preference ratings on the producer's books or delivery schedules.

However, export licenses for the listed critical materials, chiefly raw materials and basic processed forms of such materials, will be issued by the Board of Economic Warfare only within the quotas established for the other American republics by the requirements committee of the WPB. In establishing such quotas, the requirements committee will follow the policy established by President Roosevelt of supplying Latin-American countries with materials essential to the maintenance of their economies, but the amounts of such materials to be exported by the United States will be strictly limited, and will constitute only a small part of United States production and consumption.

At the same time, the United States is giving preference in exports for Latin America to those materials which will help to increase Latin-American exports of materials needed for United States war production. Order M-148 will assure delivery of listed export materials from producers to exporters on required delivery dates.

In issuing export licenses, the BEW will also consult with the branches of the WPB responsible for the materials or products involved. The branches, when necessary in each case, will allocate the total Latin-American export quota among the producers of the product affected, and each producer will then be required to give preference to orders accompanied by an export license only to the extent of his quota.

The high preference granted to exports to Latin America by Order M-148 will enable exporters to obtain assured delivery from producers on specified delivery dates, and thus avoid the necessity of piling up supplies in warehouses and at docks far ahead of shipping.

Two Congressional Bodies To Probe Oil-Supply Data

WASHINGTON, D. C.—The petroleum subcommittee of the House announced today it will hold 3 days of hearings to develop facts on what is being done to provide petroleum in areas where shortages are developing, progress of synthetic-rubber program, and economic consequences of oil and rubber shortages.

First hearings will be May 20 and other two within next 10 days. Simultaneously the Senate authorized its commerce committee to make an immediate study of ways of increasing use of inland waterways, particularly for carrying petroleum.

Resources Protection Board To Appraise Plants' War Value

WASHINGTON, D. C.—William K. Frank of the Production Division, War Production Board, has been appointed chairman of the Resources Protection Board. The agency will evaluate the relative wartime importance of all industrial plants, war installations, facilities and vital economic resources and make recommendations for their protection.

The board will cooperate closely with the Army and Navy, the Maritime Commission, and Office of Civilian Defense in furnishing ratings and recommendations by which they may be guided in planning the protection of resources.

It will make an over-all study of the relative importance to the war effort of all plants, installations, including factories, shipyards, railroads and communication networks, and mines and other natural resources. The hazards that will be considered will include bombing, sabotage, espionage or actual invasion, as well as natural hazards such as fire and flood.

For over a year the Army, Navy and other agencies have been putting into effect protective measures. The new board will act as a coordinating agency to assure that no important resource or facility has been overlooked.

The board will make comparative ratings for the nation as a whole, covering all plants and facilities and resources. In effect, the Resources Protection Board will act as a clearing house for all information bearing on the security of resources and installations.

STATE CAPITALS...

State Fair-Trade Acts Must Yield to Federal Maximum Price Ceilings

CEILINGS ESTABLISHED by the General Maximum Price Regulation will control retail selling prices in cases of any conflict with state fair-trade laws, Price Administrator Leon Henderson announced last week.

"Fair-trade agreements cannot require a retailer to sell above his ceiling price," Mr. Henderson said. "To the extent that any fair-trade agreement or state fair-trade act is inconsistent with the regulation, the regulation will control."

Three basic points on fair-trade agreements were outlined for the retailer by Mr. Henderson.

1. Fair-trade agreements may establish a minimum price which is binding upon a retailer only if that minimum is not higher than the ceiling prices of that retailer.

2. No new fair-trade agreement effective after May 18 may establish minimum prices for a retailer higher than the March ceiling price of that retailer.

3. If the highest price charged by a retailer during March was below the minimum price established by a fair-trade agreement, the retailer is nevertheless "frozen" to the prices he actually charged, regardless of the fact that in charging such price he may have violated a fair-trade agreement or a state fair-trade act.

However, in the last instance, where a retailer is "frozen" at a maximum price which forces him to sell below the minimum price set in a fair-trade agreement that was in effect in March, he may apply under Section 18 (a) of the regulation for an adjustment of his ceiling on the ground that it is "abnormally low in relation to the maximum prices of the same or similar commodities established . . . for other sellers at retail."

Trade agreements controlling minimum retail prices are generally based on one of two types of state law.

State fair-trade acts permit manufacturers or distributors of branded articles to establish minimum retail prices through agreements with the trade.

State unfair-practices acts control minimum prices without supplementary agreements, usually by forbidding a retailer from selling below cost or at less than a specified percentage—often 6 per cent—above cost.

Under either type of law, Mr. Henderson stated, minimum prices may be established only to the extent that they do not require a retailer to sell above his ceiling prices.

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CALIFORNIA

THE OFFICE OF PETROLEUM COORDINATOR has approved the May oil allocation schedules submitted to it by the production committee for District 5.

Total crude-oil allocation made was 635,800 bbl. per day, compared with 623,800 bbl. daily in April.

PRODUCERS OF HEAVY CRUDE in California Thursday held a general meeting to discuss future conditions and consider how production can be stepped up. The demand for fuel oil has reached the point where something must be done to stimulate production of heavy crude oil and other grades that produce high percentages of residual fuel. Present prices for heavy crude oil are so low that operators are unable to spend sufficient money to rejuvenate properties.

It is believed that several hundred wells could be cleaned out, the rods pulled, and perforations cleaned as well as walls scraped, and that this would result in larger production.

Producers do not want any subsidies but would like to get a better price for heavy crude oil so that they might have some money with which to pay for such rejuvenation work. Something must be done eventually to provide sufficient fuel oil for the rapidly increasing demand. Production of heavy crude has been stepped up during the past 60 days but the top has been reached and from now on remedial work on many wells will be necessary to increase production.

Elections to the Conservation Committee for the ensuing year will be held between now and the end of May. While no great changes are anticipated a few will result from revision in the boundaries of fields in order to give more equitable representation to some areas. There is a possibility too that some minor changes will be made for the June allocation in order to provide larger amounts of isobutane without increasing the production of flush fields too much.

ILLINOIS

THE PETROLEUM EMERGENCY ADVISORY Committee recently appointed by Gov. Dwight H. Green of Illinois has started an exhaustive study of all factors in the petroleum situation in the hope of avoiding gasoline and fuel-oil rationing in Illinois in view of the belief that supplies are ample to meet current demands.

The committee was appointed by Governor Green to cooperate with all governmental agencies relative to the problems of rationing gasoline and other petroleum products. In keeping with this A. H. Kreuder, superintendent of motor transportation for Wilson & Co., and chairman of the committee, appointed subcommittees to gather data on all phases of Illinois' petroleum industry.

The subcommittees appointed and members of the respective groups are as follows:

Production and refining: Brown Meece, Chicago; E. G. Youngberg, Pana; S. F. Peterson, Springfield.

Transportation: Charles F. Mansfield, Springfield; C. E. Stahly, Bloomington; Grant Sibley, Barrington.

Fuel oil: C. S. Rosenthal, Chicago; Brown Meece, Chicago; E. F. Smith, Rockford.

Consumers: Carl A. Barrett, Chicago; Charles M. Hayes, Chicago; C. H. Becker, Chicago.

G. A. Primm of Springfield, executive secretary of the Illinois Petroleum Marketers Association and secretary of the committee, will serve in an advisory capacity with all subcommittees.

TEXAS

STATE-WIDE PRORATION hearing has been set for May 26 when the Railroad Commission will take testimony upon which to base the allowable for June.

BOTTOM-HOLE PRESSURE in the East Texas field increased to 1,050 lb. on May 1, the Railroad Commission has determined on the basis of readings in 99 key wells. This was an increase of 23 lb. during April during which there were 18 shutdown days.

Since East Texas pressure reached an all-time low of 1,007 lb. on March 1, there has been a rise of 42 lb. for the field as a whole, determined by the sampling method.

The pressure of 1,050 lb. is 150 lb. above the theoretical level at which wells will stop flowing.

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Five States Modify Laws Limiting Truck Loads

Five states recently have suspended drastic truck laws and regulations which have been impeding the movement of persons and goods over the highways. During the last 18 months more than 20 states have liberalized their laws to meet the expanding highway transportation needs of the nation in its war effort.

Acting under his emergency powers, Gov. George A. Wilson of Iowa has suspended provisions of the truck laws to permit vehicles to haul larger loads. Discriminatory weight restrictions on out-of-state vehicles also were eliminated.

Under Governor Wilson's order a maximum load limit of 18,000 lb. per axle is permitted for all trucks. The suspended law places a limit of 17,000 lb. for Iowa trucks, and only 16,000 lb. per axle on out-of-state vehicles. The gross maximum-load formula was increased to 28,000 lb. plus 700 additional pounds for each foot between the front and rear axles. Maximum height of vehicles was increased by 6 in. to 12½ ft., and allowable length of a single trucking unit was increased 2 ft. to 35 ft. Maximum permissible load on any one wheel was raised to 9,000 lb. Under the suspended law the limit on Iowa trucks was 8,500 lb. Out-of-state trucks were limited to 8,000 lb. per wheel.

Gov. Prentice Cooper of Tennessee has suspended the maximum-load limit of 30,000 lb., raising the limit to 41,500 lb.

In Alabama the gross weight limit of 30,000 lb., one of the lowest in the nation, has been increased to 40,000 lb. for textiles, metals, petroleum, and other essential products. Nearly 1,000 trucks have already obtained permits to operate under the higher load limit.

The weight and length limits in Oregon have been waived for the duration of the war, according to an announcement of the Highway Commission. Under the new authorization vehicles may have a length of 60 ft. and a gross weight of 68,000 lb.

South Dakota has suspended its regulation forbidding the operation of tank trucks on Sundays and holidays.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Call a Spade a Spade

Restrictions in the use of petroleum products in many parts of the country, as news, are receiving attention equal to that being given to the active war fronts.

Approximately one-third of the gasoline consumers in 17 eastern states and the District of Columbia, who are classed as the least essential users, have been rationed to one-fourth their normal requirements. The same reductions will apply to the Pacific Northwest, effective June 1. As consumers wonder what can and will be done, they are told by the government official in charge that they are getting more gasoline than they deserve, a statement which has been interpreted to mean that additional restrictions are in prospect.

It now appears certain that gasoline rationing will be national in scope and programs will be announced, reducing the civilian use of furnace oils and probably other petroleum products later in the year.

The unfavorable public response to these developments is gaining momentum daily. Tens of thousands have discovered that their cars are practically useless on the 3-gal. per week allotment. Those who have thought they could rely on other means of transportation have found them inadequate, and they do not take the place of their cars.

Shortly it will be impressed on Washington that rationing in the use of petroleum does not come in the same class as restrictions in other products, some of which are luxuries or commodities for which there are substitutes. Consumers can't store petroleum and the significance of limited use becomes effective immediately.

It is already obvious that when the Joneses and Smiths do not have the use of their family cars a series of reactions gets under way which do not end until they have touched every part of our economic system. In millions of cases, any sizable curtailment in motor-fuel consumption immediately affects what the car owners can do relative to their part in the war program, extending from the production of raw materials to the factories.

The seriousness of the situation, regarding which more will be heard from day to day, raises the question as to whether the oil business has done all that it should in making clear the reasons for these unwanted developments. Comments in the daily press and on the air have little to say as to causes.

There has been a tendency to let the oil industry, which is in no way responsible, be the goat in this enforced petroleum famine. Washington has been reluctant to explain that the inability of the Navy to protect shipping off our own coasts is responsible for the fact that millions living in the Atlantic seaboard states and the Pacific Northwest will only be able to use their cars two or three times weekly and are facing restricted heating this winter. Obviously, all this should have been labeled "transportation rationing," not "petroleum rationing."

Now it is proposed to extend the limitations on car use to all parts of the country. The explanation offered is that more of the inland transportation facilities are needed in the movement of crude oil and products to the East and Northwest. This is transportation again.

Probably the principal reason is the desire to conserve rubber. But here as usual the governmental agencies are hiding behind petroleum. If rubber use must be curtailed, why not call it "rubber rationing" and base the needed curtailment on car mileage rather than gasoline sales as now planned. This will bring home the seriousness of the loss by the United Nations of the Southwest Pacific and its world rubber supplies.

As the war progresses, it will be increasingly necessary to call things by their right names and place responsibility where it belongs. The oil industry has an obligation to itself and its customers to see this is done in all developments affecting its own operations.

Natural-Gasoline Producers Warned Parade Is Passing

By D. E. BUCHANAN

Manufacturers of natural gasoline were warned to become an active moving force in supplying butanes and propanes for the manufacture of butadiene, styrene and toluene unless they are willing to let another segment of the war-program parade pass unnoticed.

The warning was given by D. E. Buchanan, District 3 director of the Natural Gas and Natural Gasoline Section, Office of Petroleum Coordinator, in an address in Tulsa last week before the twenty-first annual meeting of the Natural Gasoline Association of America, excerpts from which are published here.

SINCE the issuance of Recommendation 13 in October 1941, and particularly Recommendation 25 in January 1942, I know you have been anxiously awaiting some more specific statement of the role the natural-gasoline industry is to have in the prosecution of the war. I wish I could paint a clear picture for you today. The assignment to increase the production of 100-octane aviation manyfold and on such short order was a man-sized job, and it has been executed by the Refining Division of the coordinator's office working with district committees and individual companies with great credit to all. Production of the finished product in plants authorized to be built in connection with field natural gasoline and cycling plants will contribute to the total, but in point of percentage of motor-fuel equivalent produced by your industry your contribution in finished 100-octane gasoline might and should be greater. In the absence of projects from the natural-gasoline industry and with refining projects in hand, it was only natural that, with the sudden stepup in the 100-octane program following Pearl Harbor, the Refining Division of the coordinator's office should look to the refining industry for the great increase in production.

It may be said for the refiners that they responded to the call by submitting to the coordinator's office complete projects more than sufficient to meet the level of required production as each increase in the program was announced.

Very few complete projects anticipating production of finished 100-octane gasoline have been submitted by natural-gasoline manufacturers or cycling-plant operators.

Butane Survey Complete

Now before you call my hand I'm going to acknowledge that Recommendations 13 and 25 and everything else that has been said on the subject has indicated an anticipated shortage of the butanes, particularly isobutane and, by inference at least, has cataloged the natural-gasoline manufacturer and cycling-plant operator as suppliers of critical raw materials for the manufacture of the finished products somewhere else.

The natural-gasoline and cycling-plant survey called for in Recommendation 25 has been completed by all districts and the results are being studied from different angles. Of particular interest is the additional amount of isobutane available at natural-gasoline plants with the expenditure of little or no critical material. For those plants where additional quantities can be produced on a basis considered economically feasible figures are now being compiled by the Natural Gas and Natural Gasoline Section reflecting the possibilities reduced to tons of critical material per barrel per day of increased isobutane production. For future raw materials requirements such plants will be considered in the light of isomerization installations for the conversion of normal to isobutane at refineries. It is too early to predict results but it is hoped an avenue may be opened here for the expansion of isobutane production in a number of plants.

It is also too early to say to what extent normal butane may be required of you for replacement of volatility in motor fuel due to the utilization of refinery light ends in the manufacture of 100-octane gasoline.

It is realized that with the exception of a few plants where vapor pressure can be raised above 26 lb. with present facilities the time factor involved in securing equipment for increased efficiency of extraction, separation, etc., must not be overlooked and we are working toward an early determination of butane requirements both normal and iso in order that such additional plant facilities as may be necessary may be provided by the time the material is needed.

The survey, incomplete as it is at this date, seems to indicate that more than all the isobutane which can be made available at natural gasoline and cycling plants with the expenditure of little or no critical material will be needed by refiners in presently authorized 100-octane plants. As stated above, the extraction and separation of additional quantities will necessarily have to be competitive, first with critical materials required for isomerization of normal butane at refineries and then with the delivered cost at the refinery. In the final evaluation, transportation to point of consumption may very well be a serious handicap.

Propane Outlook Improved

It is anticipated that alkylation will utilize the butylenes and isobutane currently incorporated in motor fuel to the extent that the resultant motor fuel from alkylation plants will have vapor pressure of the order of 7 lb. Reid. This is, of course, too low and indicates the need for normal butane to bring volatility up to some point of more satisfactory performance but here again it is too early to predict the extent of requirements from your plants. Suffice to say, it is not beyond the possibility that it may be necessary to use propane to some extent for this purpose.

As to when you may expect this demand to materialize, it can only be said that from present indications the half-way mark of the present 100-octane program should be reached early next year and the goal by December 1943. The demand for isopentane for 100-octane gasoline is also under investigation. It now looks like the natural-gasoline manufacturer may not fare so well here. Catalytic cracking produces more isopentane than can be used in blending to present 100-octane specifications. It, therefore, appears that those refiners utilizing the catalytic cracking process may have excess isopentane available for refiners operating other types of processes.

At best the supplier of only a raw material is in a subordinate role. A parade of vastly improved processes made necessary by, and designed for, the primary production of war products is going by. I see the natural-gasoline industry standing on the sidelines. The war will be over some day. It is reasonable to assume that at that time there will be a surplus of manufacturing capacity for high-octane gasoline. Where will the natural-gasoline industry be if it has taken not one step forward in the parade? It will not only be out of date, it will be archaic. What customer of yours will even be able to use, let alone pay you a decent price for your product if it is points below the level of octane requirements of the going grades of motor fuel?

Self Preservation at Stake

You should couple up with your patriotic desire to contribute everything possible to the winning of the war the question of self-preservation during and after the war. This would seem to dictate a thorough appraisal of your present and probable future position in the motor-fuel economy and a study of the feasibility of producing 100-octane gasoline (and don't stop at 100) as well as butadiene and styrene for synthetic rubber, and toluene, all finished products at your plants. Obviously, every natural-gasoline plant is not a prospective 100-octane or butadiene plant. Construction and operating costs must be competitive with present and authorized operations but there are plants and combinations of plants with sufficient volume of raw materials available to make complete installations well worth considering. In some cases geographical location, in that they are well outside the so-called "target area" and considerable distances from any deep-water coast, will be in their favor.

I might say right here that the superaviation fuel of the future is being developed from natural-gasoline derivatives—but not by the natural-gasoline industry.

Only quite recently has any attention whatever been given to the natural toluene content of natural gasoline or condensate from cycling plants. Tests have shown appreciable toluene content in certain natural gasolines, and it is quite possible some of them may prove more desirable for toluene extraction than crude oils currently being processed. There is also the question of methylcyclohexane content for synthesis to toluene, and I urge the earliest possible conclusion of the work I understand your technical committee has undertaken in this direction.

(Continued on Page 61)

Miller Asks Action That Will Elevate Natural-Gasoline Use

By RAY E. MILLER
President, Natural Gasoline Association of America

SINCE this is our birthday, I shall digress from the usual president's report and take a few minutes to review the history of natural gasoline for the past 35 or 40 years, and also the history of our association during its 21 years of existence. Having appeared on programs of our early conventions and having served as your secretary from 1928 to 1934, I feel qualified to write a history somewhat more intimate than has ever before appeared in print—hence this Rube Goldberg account—

In the early years of the twentieth century, a child appeared amongst the family group of petroleum products. It was a wild youngster and apparently a fugitive from casinghead gas.

The fugitive character of this child is best demonstrated by the fact that when anything warmed up to it, it simply evaporated only to reappear in the most embarrassing places. It was a scrappy youngster and Bill Sutton and other pioneers put the gloves on with it a few times, but the kid "cleaned up" so quickly that some respect was accorded him.

About this time it was noted that the child showed some fondness for some of the kerosene group of children, in fact, he became absorbed in some of them to such an extent that he was sometimes called "kid absorption." Some of the early engine peddlers selfishly tried to squeeze the name "kid compression" on to the youngster, but it was unpopular and they gave up "hope" according to Gardner, Bessemer and Ingersoll-Rand and other authorities.

Hastening on with our biography—World War I found a robust youngster, a curious mixture of wild influences and many degrees of gravity. Although his recovery was poor from recent illnesses, he took on football signals as specifications and was alternately weatherbeaten and steamed up. His interest in the kerosene kids was renewed and they, being no fit playmates for him, were the cause of his downfall. For some years he teamed up with them and played the automobile circuits, billed as "motor fuel," "kerosene blend," etc., but "kid casinghead" was too wild for double harness duty and kerosene too balky—they couldn't pull together and "kid casinghead" being the orphan child, was forced to take the rap because the refiners wanted to protect their own child, "kid kerosene," even though they knew all the knocking was the result of his poor performance.

This brings us up to a period 21 years ago with "kid casinghead" an outcast, a pariah, an orphan, an unwanted child, skulking in gas pipe lines, wasting his energy in field separators and tanks, hiding on the wrong side of the railroad tracks after escaping from tank cars literally "blowing his top" in all the wrong places.

However, the farsighted and altruistic manufacturers knew there was much rehabilitation work to be done and after great labor our association was born under an assumed name.

You will remember that the child's surname had been casinghead and it had been known by

(Continued on Page 89)

A unique review of the natural-gasoline industry was presented by Ray E. Miller, Tulsa, president of the Natural Gasoline Association of America and vice president of Hanlon-Buchanan, Inc., speaking at the annual banquet of the association May 15.

Mr. Miller chose a Rube Goldberg approach to outlining some of the abuses to which the industry has been subjected in the past and used the humorous historical points as background for cautioning against results if such treatment is continued.

N.G.A.A. Launches Attack on Tank-Car Haul Limitation

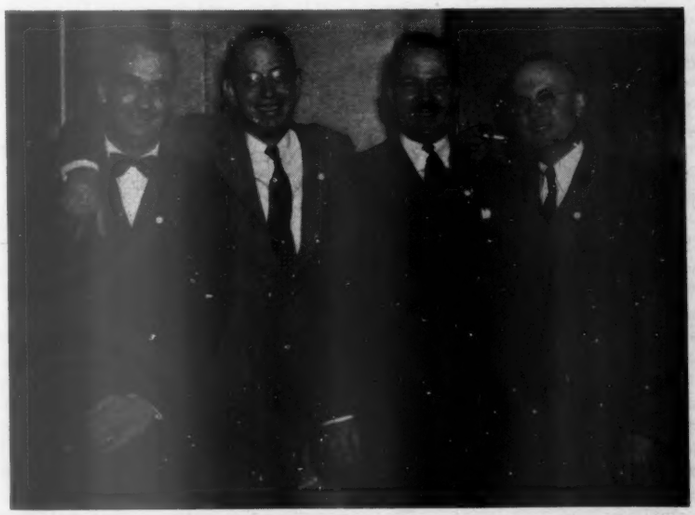
MOVEMENTS were started in Tulsa last week at the annual meeting of the Natural Gasoline Association of America to relieve the industry from the strangling implications of General Order 7 issued by the Office of Defense Transportation. The objectionable order, unless substitute transportation methods can be provided, prohibits use of tank cars in moving petroleum and other products over routes of less than 100 miles.

The association authorized William F. Lowe, secretary, to attend meetings this week in Washington, D. C., at which grievances of shippers are to be heard.

Transportation vied with technical subjects for general interest at the meeting. C. R. Musgrave, vice president of Phillips Petroleum Co., and chairman of the District 2 tank-car subcommittee, reviewed the transportation question and then conducted a question and answer session. He was unable to predict any substantial relief from the ODT order. All officers of the association were reelected, headed by Ray E. Miller, Tulsa,

BENNETT RECEIVES HANLON AWARD

E. O. Bennett, chief petroleum engineer of Continental Oil Co., received the Hanlon Award this year, the Natural Gasoline Association's recognition of outstanding service. Biographical sketch of Mr. Bennett and picture appear on Page 93.



A. J. Kerr, Pittsburgh Equitable Meter Co., chairman of the entertainment committee, Natural Gasoline Supply Men's Association; J. H. Satterwhite, Westcott & Greis, Inc., a director; D. E. Field, Tulsa Boiler & Machinery Co., entertainment committee; V. C. Canter, Frick-Reid Supply Corp., director; L. S. Allen, National Tank Co., retiring president; L. J. Griffey, Hanlon-Waters, Inc., new director, and George W. Probst, Clark Brothers Co., new president of the association

president and vice president of Hanlon-Buchanan, Inc.

One new vice president, C. R. Williams, Chicago Corp., was chosen along with the four re-elected, including H. A. Ells, Cities Service Oil Co.; H. H. Beeson, Sabine Valley Gasoline Co., Inc.; J. R. Jarvis, Lone Star Gas Co.; and J. W. Vaiden, Skelly Oil Co.

Featured speaker at the annual banquet May 15 was William B. Stout, president of Stout Engineering Laboratories, Inc., Detroit, Mich., who predicted radical changes in the way of living as a result of technological development during the war. He repeated his prediction that the average man would use helicopters as the conventional mode of travel after the war.

Emphasis was given the superior performance of American machines, particularly aviation engines, which, Mr. Stout said, are doing routine tasks in this war that far surpass enemy planes.

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Natural Gasoline Supply Men Elect G. W. Probst President

NEW officers and five members of the board were elected last week at the annual meeting of the Natural Gasoline Supply Men's Association which has been assembling with and cooperating with the Natural Gasoline Association of America for more than 15 years.

George W. Probst, Clark Brothers Co., was elected president, succeeding L. S. (Spider) Allen, National Tank Co. The new first vice president is Charles D. Peterson, Fisher Governor Co., and the second vice president is A. M. Buxton, Cooper-Bessemer Corp. J. A. Knebel, Joseph A. Coy Co., is treasurer.

New directors elected to serve for the fiscal years 1942-43 and 1943-44 are: L. J. Griffey, Hanlon-Waters, Inc.; Mr. Knebel; Warner Lewis, Warner Lewis Co.; C. S. Simons, Midwest Piping & Supply Co., and Paul C. Wallack, Walco Engineering & Construction Co.

Five holdover members of the supply men's board whose terms will expire next year are: Messrs. Allen, Probst and Buxton; V. C. Canter, Frick-Reid Supply Corp., and J. H. Satterwhite, Westcott & Greis, Inc.

The supply men's association was host at the only entertainment provided at last week's annual meeting of the N.G.A.A., consisting of a buffet dinner and program.

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Effort Started to Classify Drilling as Essential Task

DALLAS, Tex.—Efforts to curb the drain by selective service on the personnel by contractors and oil companies doing their own drilling have been started by the American Association of Oil-Well Drilling Contractors.

In a recent letter to the director of selective service, the association pointed out that because of the application of the law many oil-well drilling contractors believed that they might be unable to retain key men in their organizations sufficient to carry out the drilling program which may be required in this country.

It was explained that the business of drilling oil wells has not been classed as a defense industry under present regulations, and that local boards generally had failed to regard the oil-well drilling business even as a necessary civilian activity. The association further advised that in the past there has been some drain by selection of key men employed by drilling contractors.

The director was advised that the Office of Petroleum Coordinator was familiar with necessary requirements of oil production and with the advisability of maintaining existing organizations of drilling contractors. No formal request for special classification or for deferment of key men in the drilling industry was made, but it was explained that the Selective Service System and the Office of Petroleum Coordinator should be able to agree on a plan meeting the requirements of both the drilling contractor and the service.

Both the OPC and the director of selective service were advised that an attempt would be made to obtain from members of the drilling contracting industry by questionnaire some definite information regarding the effect of the Selective Service laws.

To the associations the Selective Service System replied:

"The Selective Training and Service Act of 1940, as amended, prohibits the deferment of individuals by occupational groups, or groups of individuals in any plant or institution, but it provides for the deferment of individual registrants who are engaged in any business, industry, governmental service, or agricultural pursuit, dependent upon the position held. If the registrant is considered to be a key man, in one of the activities enumerated above, he may be classified by his local board as such, based upon the information contained in the questionnaire and supporting data, such as Form 42 A (Affidavit to Support Claim for Occupational Deferment) submitted by the employer.

"It is felt that, with available information presented to the local board by the registrant and his employer, a key man employed by any of the oil-well drilling firms of your state will be given every consideration by his local board; and if the local board fails to place the registrant in Class 2-A as a 'necessary man,' he has the right of appeal from the classification given to him by his local board. Also the employer has the right to appeal, on behalf of his employe, from the classification given by the local board. In this way, it is hoped that any business or industry that is essential to the war effort will be given protection for its key employes. However, there is an obligation upon the part of the employer to place in training such men as he deems necessary to replace the present key employes who have been granted a deferment of a period not to exceed 6 months at any one time.

"This headquarters has under consideration at the present time the issuance of an occupational bulletin covering the oil industry, which will list critical occupations necessary to the successful operation of the oil industry and which we feel will be of some assistance to the local boards in placing the registrants in their proper classifications."

A form of the questionnaire this association proposes to send to drilling contractors in an effort to obtain definite information on the effect of the Selective Service System on them was sent to OPC for suggestions.

We have been informed that in spite of the smaller number of wells that will be drilled this year, it is important that the drilling of wildcat wells be continued at former levels or, perhaps, at an accelerated rate in order to develop new reserves.

The idea of polling the industry by questionnaire was approved and a number of suggestions were made that should make the questionnaire more valuable.

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Card Rationing Extended To Pacific Northwest

WASHINGTON, D. C.—Card rationing of gasoline in the states of Washington and Oregon beginning June 1 was announced today by the Office of Price Administration.

OPA action followed the War Production Board Limitation Order L-70, as amended effective the same date, curtailing deliveries of gasoline to dealers in those states by 50 per cent. As in the East, where an emergency plan for rationing goes into effect May 15, the rationing area in the two Pacific Coast states will coincide with that covered by the limitation order.

The plan of rationing will be the same as that being put in effect in the East, OPA said. It will operate for a 30-day period, until July 1, when a more comprehensive coupon rationing plan will be instituted.

Registration will take place in the elementary schools on May 28 and 29.

The "A," "B" and "X" cards to be issued the approximately 700,000 car owners, as well as to all owners of inboard motor boats, will be the same as those issued in the East except for one detail—the number of units. In view of the fact that the plan will be in operation for a shorter period—30 days instead of 47—there will be fewer units on each type of card.

An "A" card will contain five units (instead of seven); a "B-1" card eight (instead of 11); a "B-2" card 10 (instead of 15); and a "B-3" card 13 (instead of 19). "X" cards will be issued to a specified group of drivers "for essential use."

The value of each unit will be 3 gal.

Antifreeze Manufacturers Will Be Assigned Quotas

WASHINGTON, D. C.—Production of antifreeze will be placed upon a quota basis by Order L-51, issued May 14 by the Director of Industry Operations, War Production Board.

Quotas have not yet been set, but they are expected to approximate 50 per cent of the amount of antifreeze sold by each producer in 1941.

Antifreeze manufactured for the Army, Navy, other governmental agencies, Lend-Lease, or for the governments of the British Empire, Belgium, China, Greece, the Netherlands, Norway, Poland, Russia, and Yugoslavia may be made in addition to quotas.

The reason for the order is that antifreeze compounds are made of ethyl, methyl, and isopropyl alcohol and ethylene glycol, all of which are critical war materials.

Natural Gasoline

Speed-Up Order of WPB Has Special Significance for Natural Gasoline

NATURAL-GASOLINE manufacturers as well as refiners who have tentative plans for participating in the production of war materials were given added impetus last week to push construction as rapidly as possible. The incentive to speed up construction and the ramified details preceding plants that are essentially predicated on the war program was contained in the War Production Board announcement that virtually all projects that cannot be completed and in operation by mid-1943 would be canceled.

The announcement, made by a high spokesman of the War Production Board in Washington, explained that construction would be pushed on such facilities as synthetic-rubber plants and aviation-gasoline installations. Some interpreted the singling out of the two types of plants to which most efforts of both branches of the industry are now devoted as meaning that the time-schedule ruling would not apply. However, others were convinced that speedy completion of plans would be the best possible protection against interruption of schedules.

WPB was said to have been guided in its do-it-now proclamation by two major considerations: (1) Severe shortages of critical materials and (2) belief that developments this summer and fall may change the outlook. In either event, most natural-gasoline manufacturers who have been given comparatively small parts in the 100-octane aviation fuel program feel that speed is now more essential than ever because the synthetic-rubber situation is both timely and pertinent to operations.

Attention of WPB will be concentrated on the production of war materials over the next few months, rather than on construction of plants in which to produce military equipment. The program was described for general industry, points of which are applicable to manufacturing facilities of the oil business, in this manner:

Facilities already substantially under way will be completed. All war construction authorized or under contract but not yet begun will be reviewed and evaluated on the basis of answers to four questions: Is the project absolutely necessary? Can existing plants or facilities be used instead of new construction? How much of a drain will it be on materials supplies? When would it be in production?

Further, if and when new plants are approved in the future, they will be erected strictly as temporary buildings, probably constructed largely of wood and using little if any steel.

Prospects of a major 1942 offensive by the United Nations, it was understood, developed some apprehension that if too much emphasis were placed on 1943 war production goals, this year's output might be hampered seriously. Thus, WPB has determined to produce 60,000 planes, 45,000 tanks and 8,000,000 tons of shipping in 1942 and deal with the vastly increased program for 1943 when that time comes, officials explained.

On this basis, steel supplies will go into ships and guns and tanks which are needed immediately, rather than into new plants which cannot be completed until late next year or in 1944. One spokesman predicted that the planned 15,000,000-ton extension of the nation's steel capacity probably would be reduced to around 5,000,000 tons.

British American Producing Alkylate at Gasoline Plant

TORONTO, Ont.—Announcement has been made that the British American Oil Co. gasoline absorption plant in Turner Valley, Alberta, is now producing alkylate, chief blending component for aviation gasoline.

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Petroleum Rail Shipments Average 652,082 Bbl. Daily

WASHINGTON, D. C.—Daily tank-car movement of petroleum and petroleum products to the East Coast reached another new high of 652,082 bbl. during the week ended May 9, Petroleum Coordinator Harold L. Ickes announced. This was an increase of 1.7 per cent over the preceding week, when movement averaged 640,478 bbl. a day.

Oil shipments from California to Oregon and Washington dropped off, however, from 29,429 bbl. daily to 28,480 bbl.

In shipping 652,082 bbl. daily into the east, the 23 companies participating in this movement reported to Deputy Coordinator Ralph K. Davies that they loaded 20,287 cars. Including cars that were on the way back for reloading, it is estimated that the East Coast service was employing 46,350 cars, taken largely from other sections of the country.

On the basis of an average of 225 bbl. per car, the 20,287 loaded cars carried the equivalent of 4,564,575 bbl. of petroleum and petroleum products.

Eastern shipments were: American Mineral Spirits Co., 116 cars; Arkansas Fuel Oil Co., 214; Ashland Refining Co., 278; Atlantic Refining Co., 2,440; James B. Berry Sons Co., 2; Chalmette Petroleum Co., 18; Cities Service Oil Co., 971; Continental Oil Co., 212; Crown Central Petroleum Co., 15; Gulf Oil Co., 1,337; Hartol Products, 130; Pan American, 1,204; Petrol Corp., 407; Petroleum Heat & Power Co., 21; Pure Oil Co., 165; Shell Oil Co., 1,031; Sinclair Refining Co., 1,728; Socony-Vacuum Oil Co., 2,844; Standard Oil of Kentucky, 126; Standard Oil of New Jersey, 3,807; Sun Oil Co., 1,069; Texas Co., 1,674; and Tide Water Associated Oil Co. 478.

The seven companies that participated in the Northwest movement reported loading 886 cars during the week, compared with 916 cars during the week ending May 2. This is an average movement of 28,480 bbl. per day for the week ending May 9.

Allowing time for empty cars to return to California, it is estimated that 2,225 cars are engaged now in Pacific Northwest service.

Northwest shipments were: General Petroleum, 46 cars; Richfield, 54; Shell, 227; Standard of California, 342; Texas Co., 17; Tide Water Associated Oil Co., 99; and Union Oil Co., 101.

Natural Gas News

Colorado Interstate Plea Rejected by Power Board

WASHINGTON, D. C.—The Federal Power Commission announced last week its orders and Opinion No. 73-A denying petitions by the Canadian River Gas Co., Colorado Interstate Gas Co., and Colorado-Wyoming Gas Co. asking that rehearings and stay be granted on the commission's orders of March 18, 1942, and Opinion No. 73, which ordered reductions aggregating $2,745,000 annually in the wholesale natural-gas rates of the three affiliated companies. Each of the orders of denial states that "no new facts have been presented or alleged in the petition for rehearing which would justify a reversal or revision of the commission's order."

The March 18 orders provided that the rate reduction shall be reflected in all bills regularly rendered on and after May 15, 1942, by the Canadian and Colorado Interstate companies, and in all such bills rendered on and after June 15, 1942, by the Colorado-Wyoming company.

The petitions contended, primarily, that taxes and operating costs are increasing to such an extent that the application of the commission's rate-base figures (calculated on operations for the year 1939) would be unjust and confiscatory. In rejecting the contention that higher taxes would impose an undue hardship, the commission held in its opinion announced last week that the rate cuts ordered will reduce the companies' net income to a point where excess earnings, and consequently any liability for excess profits taxes, will be eliminated. With respect to increased operating costs, the opinion states that "isolated items of claimed increase of cost of operations are asserted, but no allegations are made as to either the gross or the net operating revenues realized by the companies for the year 1941 and the period subsequent thereto."

The March orders terminating the proceedings directed the Canadian River Gas Co. to reduce wholesale natural-gas rates by $561,000 annually; Colorado Interstate Gas Co. by $2,065,000 annually; and Colorado-Wyoming Gas Co. by $119,000 annually. Of these amounts, which total $2,745,000, amounts aggregating $649,000 are duplicated (included more than once due to transactions between the above three companies).

Cities Service Lays Line in Panhandle

Cities Service Gas Co. has been given the contract to furnish gas to the two defense plants near Amarillo, Tex., now under construction. The company has a large reserve not far from the plants. A 15½-mile 12-in. line will be laid down from the west end of the Cities Service 16-in. line in the Burnett pasture, starting at the SW cor. of Section 55, Block 5, I.&G.N. Survey, Carson County, Texas, running to the west side of the Pantex plant; and from there a 5½-in. line will be laid to the mechanics training school.

Loco Hills and Tussey Fields Under Special Price Orders

WASHINGTON, D. C.—Maximum prices for crude oil produced in the Loco Hills area of Eddy County, New Mexico, were set last week at $1.12 per barrel of 40° gravity, with customary differentials for lower gravities, Price Administrator Leon Henderson announced.

The new ceiling, effective May 13, was contained in Amendment 12 to Revised Price Schedule 88—Petroleum and Petroleum Products—and corresponds to the scale at which 95 per cent of the production from the Loco Hills area was sold last October.

In pools where two or more posted prices were in effect on October 1, 1941, Price Schedule 88 set the ceiling for production from each well at the price at which it was selling on that date. Until the May 13 amendment became effective, a relatively insignificant part of the oil in the Loco Hills area had a ceiling below that established for the rest of the production. The OPA action was taken on a petition by S. P. Yates of Artesia, N. M., and the Continental Oil Co.

The amendment also set a maximum price of $1.25 a barrel for crude petroleum of 40° gravity produced in Garvin County, Oklahoma, from the Tussy field.

This figure has been set in Revised Price Schedule 88 for oil produced in Carter County, Oklahoma. The extension was ordered when a petition by Cosco Oil Co. of Wynnewood, Okla., disclosed that a single oil field known as the Tussey field was located in both Carter and Garvin counties.

OPC Brands as False Reports Of Gasoline Destruction

WASHINGTON, D. C.—Reports that it has been necessary to destroy gasoline in the Chicago area were flatly denied last week by the Office of Petroleum Coordinator.

Deputy Coordinator Ralph K. Davies stated:

"The attention of the Office of Petroleum Coordinator has been called to reports of gasoline having had to be destroyed in the Chicago area for lack of storage space.

"Such reports are completely without foundation. The storage situation in that area is not one which would require any such action on the part of any company or individual. Furthermore, this office would oppose, with all the power at its command, the taking of any such step.

"Supplies of motor fuel in the Chicago district have been ample, but demand has been sufficient to prevent any undue increase in storage. In fact, all the indications are that gasoline inventories will be shrinking shortly in that section.

"Irresponsible statements about gasoline destruction in the Chicago area are obviously without foundation."

Henderson Announces Amendments To Price Schedule 88

WASHINGTON, D. C.—Three amendments to Revised Price Schedule 88—Petroleum and Petroleum Products—were announced Monday by Price Administrator Leon Henderson, covering these chief points:

1. Companies which are complete corporate affiliates may apply to OPA to have their intercompany sales exempted from maximum prices established under Schedule 88, or to eliminate such sales from the determination of maximum prices to outsiders (Amendment 13).

2. In California, Oregon, Washington, Nevada and Arizona, the use of quotations in trade journals as a basis of maximum prices is abandoned and instead maximum prices in these five states will be determined by either the last sale of substantial quantity during the 60 days prior to October 15, 1941, or the prevailing market price on October 1, 1941 (Amendment 14).

3. The "last sale" within 60 days prior to October 15, 1941, used in determining the maximum price, is limited to the last sale within this period to "a purchaser of the same general class" (Amendment 14).

4. The term "sale" as used in determining maximum prices has been further interpreted in regard to deliveries made under contracts entered into more than 60 days prior to October 15, 1941 (Amendment 14).

5. Long-term contracts may be executed containing a pricing formula in which the major factor is the market price prevailing on the date of delivery, provided that the prices as adjusted are not in excess of the maximum prices in effect (Amendment 15).

Combined Annual Petroleum Conference Program Announced

The Illinois-Indiana Petroleum Association and the Illinois basin chapter of the American Petroleum Institute announce the completion of a program for the combined meeting of the two organizations to be held in Robinson, Ill., Saturday, June 6.

Because of the tremendous importance of oil in the nation's war effort, this year's meeting has been keyed to coincide with the war emergency. The meeting has been planned with only one purpose in mind—to bring the operators the latest developments touching upon industry problems together with a discussion of future trends.

In the afternoon, at the Crawford County Country Club, a number of informal discussions will be held, headed by Wirt Franklin, director of production for District 2, and members of his staff This will provide an excellent opportunity for the operators to air their local problems. The evening session and banquet will be held in the Robinson Township High School Auditorium. Donald R. Knowlton, director of production in the Office of Petroleum Coordinator for War, will be the speaker for the evening. His message will not only be timely and informative, but will give an insight into the OPC's long-range program.

New England Oil Men Will Convene May 26

The Independent Oil Men's Association of New England will hold a convention May 26, at the Copley Plaza Hotel, Boston, Mass. Several speakers from Washington have been arranged for, headed by Harold L. Ickes, of the OPC. Other speakers include Joseph H. Salmon, Robert Colacott, Daniel J. Shanahan, and Tucker Dean, of the Office of Price Administration, and Samuel F. Niness, of the Office of Defense Transportation. It is also anticipated that a speaker will be present from the War Production Board. Mr. Ickes' address will have to do with the gasoline-rationing program.

Consolidated Receives Seventh Mexican Payment

NEW YORK.—The seventh installment of $1,000,000 was received here last week by Consolidated Oil Corp. from the Mexican Government, leaving a balance of $1,500,000 unpaid in the agreement settling Sinclair claims for expropriated oil properties in Mexico.

DEATHS

WILLIAM L. VALENTINE, 72, founder of the Fullerton Oil Co., Los Angeles, Calif., died May 9. He had been in ill health for the past 2 years. In 1900 he merged Fullerton Oil Co., a California corporation, with Fullerton Oil Co., an Arizona corporation. Mr. Valentine served as secretary of the company until 1918, at which time he assumed the presidency. He leaves his widow, two daughters and three sons.

HUGH ELEY, geologist with Magnolia Petroleum Co. in the Midland, Tex., district for the past 2 years, died May 10 in a Dallas, Tex., hospital. He had been ill several weeks, and had been removed to the hospital the day before he died. Death was attributed to a tropical fever. His widow survives.

THEODORE FRANKLIN KITTREDGE, 55, Little Rock, Ark., died in a Little Rock hospital on May 9. He was district manager for Dearborn Chemical Co. of Chicago, in Arkansas, Louisiana and East Texas. He had been associated with the company since 1925. He is survived by his wife and a son.

MILLARD FILLMORE WHITEHILL, 87, oil operator in the Pennsylvania fields, died last week at his home in Washington, Pa. Mr. Whitehill began his career in the oil industry when a young man and followed the business throughout his life. He aided in opening the Washington field and drilled the second well in that district. His widow, a son and two daughters survive.

S. L. MILTON, 63, who had been prominent in Wichita, Kans., oil circles for 20 years, died in a Tulsa hospital last week. He had come to Tulsa to visit his son, a student at University of Tulsa. Earlier in his career, Mr. Milton was pitcher and later manager of the Wichita baseball team of the Western League.

W. L. KINGSLAND, 72, former oil operator of Amarillo, Tex., died at his home in Los Angeles, Calif., last week, following a long illness. He is survived by two daughters and a son.

DELMORE L. COBB, 65, secretary-treasurer of Lone Star Gas Co. and the last remaining executive who joined the company upon its founding in 1909, died suddenly May 9 at his home in Dallas, Tex. At various times he had been active in numerous associations in connection with the oil and gas industry.

THOMAS EDWARD SHIELDS, 60, who had been employed as a gager for Eldred Refining Co. for 24 years, died at his home in Eldred, Pa., last week. He had been in ill health for some time. His widow, two daughters and two sons survive.

JOHN R. SHOUP, 66, died in a Franklin, Pa., hospital last week. Mr. Shoup was an oil man of wide experience and had worked the various fields of Pennsylvania. He was for 15 years field man in Peru for International Petroleum Co. His widow, a son and a daughter survive.

EARL CLARENCE SULLIVAN, 46, oil-field worker of Petrolia, Tex., died last week of a heart attack. He was under treatment in a Wichita Falls, Tex., hospital. His widow, a son and a daughter survive.

CARY D. WATERS, president of C. J. Tagliabue Manufacturing Co., Brooklyn, N. Y., died May 9.

CY RIEGER, Amarillo, Tex., and Panhandle oil producer, died Sunday in St. Paul, Minn. Mr. Rieger was an ardent sports fan, and for 15 years was a semipro baseball pitcher, a career which was cut short by the first World War. He is survived by his widow.

ENGINEERING *and Operating* SECTION

▼

Physical Constants of Low Boiling-Point Hydrocarbons

By ROBERT MATTESON and W. S. HANNA
Research and Development Department,
Standard Oil Co. of California

DURING the past 10 years a number of useful compilations [1,2,3,4,5,6,7] of physical constants, ranging from the California Natural Gasoline Association's concise tabulation to the exhaustive volumes by Egloff, have been published. None of these, however, serves as a compact table suitable for notebook use by the engineer or research technologist in the petroleum and allied industries. To fill this need a table of the physical constants of a number of hydrocarbons, principally in the gasoline boiling range, and certain miscellaneous compounds of interest in the petroleum and natural-gas industries has been prepared. The tabulation of constants is given here as Table 1, and the bibliography of references from which the basic constants were derived is contained in Table 2.

Table 1 is made up of the fundamental constants representing experimental data reported in the literature and calculated constants all converted to English units in order to be of maximum utility in engineering computations.

Discussion of Individual Constants

1. *Molecular weight.*

Melecular weights are based upon the 1941 International Atomic Weights.

2. *Carbon-hydrogen ratio.*

This constant is the ratio of the weight of carbon to the weight of hydrogen in the hydrocarbon molecules.

3. *Melting points, boiling points, critical constants, and liquid density in grams per milliliter.*

The values in Table 1 are based upon the data given in the sources noted in Table 2. The liquid densities shown for methane, ethane, ethene, and propene are the best available approximations. Those for propane, the butanes, and the butenes are observed values of the density of the liquids under their respective vapor pressures at 60° F. instead of 760 mm. as shown in the column heading. The small effect of compressibility of the liquid is entirely negligible for engineering computations.

4. *A.P.I. gravity and pounds per gallon, etc.*

Liquid densities were converted to A.P.I. gravities and pounds per gallon by means of the tables or formula given in the National Bureau of Standards Circular C-140, issued March 4, 1936. Gram mols per milliliter and pound mols per 100 gal. were calculated from the above-mentioned constants.

5. *Gas densities.*

The specific gravity of the gases was calculated on the basis of air = 1.00 and the molecular weight of air = 28.966.

$$\text{Sp. gr.} = \frac{M.W.\ \text{gas}}{28.966}$$

The number of pounds per 1,000 cu. ft. of vapor was calculated on a perfect gas basis, i.e.:

$$1000 \times M.W. \times \frac{28.316}{453.592} \times \frac{492}{520} \times \frac{1}{22.414}$$

The cubic feet of gas equivalent to a gallon of vaporized liquid was calculated from the relations:

$$\frac{1}{1000} \cdot \frac{\text{Pounds}}{\text{Gallon}} \cdot \frac{1}{\frac{\text{Pounds}}{\text{M.c.f.}}}$$

A column of values is also given showing the "actual" volume of gas at 60° F. and 760 mm. formed upon vaporization of a gallon of liquid. These values are obtained by dividing the perfect gas values by the gas law deviation factor.

The unit volume of gas per unit volume of liquid was obtained from the relation

$$\frac{V_{\text{gas}}}{V_{\text{liq.}}} = \frac{\text{Cubic feet of gas}}{\text{Gallon}} \times 7.481$$

6. *Gas-law deviation factor.*

This factor is defined by the equation:

$$Y = \frac{nRT}{PV} \qquad (n = 1.0)$$

where Y is the factor indicating the degree of departure from the perfect gas laws, and is equal to 1.000 at zero pressure.

7. *Specific heats and ratios of specific heats.*

Values were taken from the sources noted in the bibliography. The units for specific heats are either B.t.u.'s per pound or calories per gram. The ratios, of course, are dimensionless.

8. *Heats of combustion.*

The values in Table 1 are based principally upon the work of Rossini and his coworkers. All data published as units of energy per mol were converted to the 1941 molecular weights before expressing the calorific value in the English system of units.

9. *Heats of vaporization and fusion.*

Quantities were taken from the sources noted in the bibliography.

10. *Air required for combustion.*

Data under this heading were calculated on a perfect gas basis employing the usual stoichiometric formulas and taking 21 per cent as the oxygen content of the air.

11. *Inflammability limits.*

All values shown in these columns were taken from Jones' paper (Ref. 53 in Table 2).

12. *Refractive index.*

Data were taken from sources noted in the bibliography.

(Continued on Page 36)

Presented by D. B. Johns, Standard Oil Co. of California, before C.N.G.A. meeting April 10, 1942.

Table 1—Physical Constants of the Light

No.	Compound	Formula	Molecular Weight	Carbon/Hydrogen Ratio	Melting Point (760 mm.), °F.	Boiling Point (760 mm.), °F.	Critical Constants: Pressure Lbs/Sq.In.	Critical Constants: Temperature °F.	Liquid Density (760 mm., 60°F.): Gram/Ml.	Liquid Density (760 mm., 60°F.): °A.P.I.	Liquid Density (760 mm., 60°F.): Lbs./Gal.	Liquid Density (760 mm., 60°F.): Gram Mols/Ml.	Liquid Density (760 mm., 60°F.): Lb. Mols per 100 Gallons	Gas Density (760 mm., 60°F.) PERFECT GAS: Specific Gravity Air = 1	Gas Density (760 mm., 60°F.) PERFECT GAS: Lbs. per 1000 Cu. Feet	Gas Density (760 mm., 60°F.) PERFECT GAS: Cu. Ft. Gas per Gal. Liquid	Gas Density (760 mm., 60°F.) PERFECT GAS: Unit Vol. of Gas/Unit Vol. Liq.	Cu. Ft. Gas per Gallon Liquid (Actual)	** Gas Law - Deviation Factor at 760 mm., 60°F.	C_p
	Paraffin Series C_nH_{2n+2}																			
1	Methane	CH_4	16.042	2.98	-296.5	-258.5	673	-116.5	(.3)	-	(2.5)	0.019	15.6	0.5538	42.28	59.1	442.1	59.0	1.002	0.530
2	Ethane	C_2H_6	30.069	3.97	-297.8	-128.2	708	+90.1	(.4)	-	(3.3)	0.013	11.0	1.0381	79.25	41.6	311.2	41.3	1.008	0.415
3	Propane	C_3H_8	44.095	4.45	-305.8	-43.8	617	206.2	0.509	146.5	4.239	0.0115	9.614	1.5222	116.21	36.48	272.9	35.91	1.016	0.376
4	n-Butane	C_4H_{10}	58.121	4.76	-218.2	+31.1	551	305.6	0.584	110.8	4.863	0.0100	8.367	2.0065	153.18	31.75	237.5	30.77	1.032	0.357
5	Isobutane	C_4H_{10}	58.121	4.76	-229.0	+10.0	544	273.2	0.564	119.4	4.697	0.0097	8.081	2.0065	153.18	30.66	229.4	29.77	1.030	0.357
6	n-Pentane	C_5H_{12}	72.147	4.96	-201.5	97.0	485	387.0	0.631	98.8	5.251	0.0087	7.278	2.4908	190.15	27.62	206.6	26.35	1.048	0.347
7	Isopentane	C_5H_{12}	72.147	4.96	-257.1	82.4	482	370.0	0.625	94.9	5.201	0.0087	7.209	2.4908	190.15	27.35	204.6	26.17	1.045	
8	2,2-Dimethyl Propane	C_5H_{12}	72.147	4.96	+2.1	49.1	485	363	0.598	101.5	4.980	0.0083	6.903	2.4908	190.15	26.20	195.93	26.19	-	
9	n-Hexane	C_6H_{14}	86.173	5.11	-139.9	155.7	434	454.6	0.664	81.6	5.526	0.0077	6.413	2.9749	227.11	24.33	182.0	22.82	1.066	0.339
10	2,2-Dimethyl Butane	C_6H_{14}	86.173	5.11	-144.8	121.5	-	414.5	0.653	85.2	5.435	0.0076	6.307	2.9749	227.11	25.93	179.0		-	
11	2,3-Dimethyl Butane	C_6H_{14}	86.173	5.11	-199.5	136.4	451	440.5	0.667	80.6	5.552	0.0077	6.443	2.9749	227.11	24.45	182.9		-	
12	2-Methyl Pentane	C_6H_{14}	86.173	5.11	-245.2	140.5	-	442.4	0.658	83.6	5.476	0.0076	6.355	2.9749	227.11	24.11	180.4		-	
13	3-Methyl Pentane	C_6H_{14}	86.173	5.11	-180.4	145.8	469	440.6	0.669	80.0	5.568	0.0077	6.461	2.9749	227.11	24.52	183.4		-	
14	n-Heptane	C_7H_{16}	100.199	5.21	-131.4	209.1	397	512.6	0.688	74.2	5.727	0.0069	5.716	3.4592	264.08	21.69	162.3	19.95	1.087	0.335
15	2-Methyl Hexane	C_7H_{16}	100.199	5.21	-180.8	194.2	400	496.2	0.683	75.7	5.685	0.0068	5.674	3.4592	264.08	21.53	161.1		-	
16	n-Octane	C_8H_{18}	114.226	5.30	-70.2	258.1	361	564.8	0.707	68.6	5.885	0.0062	5.152	3.9435	301.05	19.55	146.3	17.77	1.100	0.330
17	2,2,4-Trimethyl Pentane	C_8H_{18}	114.226	5.30	-161.3	210.7	360	530.6	0.696	71.8	5.793	0.0061	5.072	3.9435	301.05	19.24	143.9		-	
18	n-Nonane	C_9H_{20}	128.252	5.36	-64.7	303.3	337	612.0	0.722	64.5	6.010	0.0056	4.686	4.4276	338.01	17.78	133.0	15.88	1.120	0.327
19	n-Decane	$C_{10}H_{22}$	142.278	5.42	-21.5	345.2	312	655.0	0.734	61.3	6.110	0.0052	4.294	4.9119	374.98	16.29	121.9	14.29	1.140	0.323
	Olefin Series C_nH_{2n}																			
20	Ethene	C_2H_4	28.052	5.96	-272.6	-154.7	749	49.5	(.4)	-	(3.3)	0.014	11.8	0.9684	73.93	44.6	333.7	44.33	1.006	0.362
21	Propene	C_3H_6	42.079	5.96	-300.8	-54.0	668	196.8	(.5)	-	(4.2)	0.012	10.0	1.4527	110.90	37.9	283.5	37.41	1.013	0.351
22	Butene-1	C_4H_8	56.105	5.96	-319.0	+20.4	-	291.2	0.600	104.3	5.001	0.0107	8.914	1.9370	147.87	33.81	252.9	33.15	1.020	0.346
23	cis Butene-2	C_4H_8	56.105	5.96	-218.7	+38.7	-	311.0	0.615	98.6	5.118	0.0110	9.122	1.9370	147.87	34.61	258.9	33.93	1.020	
24	trans Butene-2	C_4H_8	56.105	5.96	-158.4	33.7	-	311.0	0.615	98.6	5.118	0.0110	9.122	1.9370	147.87	34.61	258.9	33.93	1.020	
25	Isobutene	C_4H_8	56.105	5.96	-221.3	19.4	-	290.3	0.603	103.2	5.018	0.0107	8.944	1.9370	147.87	33.94	254.0	33.27	1.020	
26	Pentene-1	C_5H_{10}	70.131	5.96	-209.6	86.2	595	394.2	0.648	86.9	5.393	0.0092	7.693	2.4211	184.83	29.18	218.3	28.33	1.030	
27	Pentene-2	C_5H_{10}	70.131	5.96	-216.4	96.8	-	376.9	0.655	84.5	5.452	0.0093	7.774	2.4211	184.83	29.50	220.7	28.64	1.030	
28	2-Methylbutene-2	C_5H_{10}	70.131	5.96	-191.2	101.5	-	377	0.664	81.6	5.526	0.0093	7.880	2.4211	184.83	29.90	223.7			
29	3-Methylbutene-1	C_5H_{10}	70.131	5.96	-211.0	68.2	498	377	0.635	91.3	5.285	0.0091	7.536	2.4211	184.83	28.59	213.9			
30	Hexene-1	C_6H_{12}	84.157	5.96	-216.4	146.3	-	470.3	0.679	76.9	5.652	0.0081	6.716	2.9054	221.80	25.48	190.6			
31	Heptene-1	C_7H_{14}	98.183	5.96	-183.5	199.6	-	.	0.702	70.1	5.843	0.0071	5.951	3.3895	258.76	22.58	168.9			
32	Octene-1	C_8H_{16}	112.210	5.96	-155.2	252.5	-	580.6	0.720	65.0	5.994	0.0064	5.342	3.8738	295.73	20.27	151.6			
33	Nonene-1	C_9H_{18}	126.232	5.96	-	301.8	-	-	0.735	61.0	6.119	0.0059	4.847	4.3579	332.69	18.39	137.6			
34	Decene-1	$C_{10}H_{20}$	140.262	5.96	-112	341.6	-	-	0.748	57.7	6.227	0.0053	4.440	4.8424	369.67	16.84	126.0			
	Aromatic Series C_nH_{2n-6}																			
35	Benzene	C_6H_6	78.108	11.91	+41.9	176.2	700	551.3	0.882	28.9	7.344	0.0113	9.402	2.6966	205.86	35.67	266.9	34.63	1.030	0.256
36	Toluene	C_7H_8	92.134	10.43	-139.2	230.9	611	609.1	0.870	31.1	7.244	0.0094	7.862	3.1807	242.82	29.83	223.2	28.68	1.040	
37	m-Xylene	C_8H_{10}	106.140	9.53	-53.3	282.2	526	654.1	0.867	31.7	7.219	0.0082	6.800	3.6643	279.74	25.81	193.1	24.58	1.050	
38	O-Xylene	C_8H_{10}	106.140	9.53	-13.5	291.2	542	676.9	0.883	28.8	7.353	0.0083	6.928	3.6643	279.74	26.29	196.7	25.03	1.050	
39	p-Xylene	C_8H_{10}	106.140	9.53	+55.8	281.1	515	651.4	0.864	32.3	7.194	0.0081	6.776	3.6643	279.74	25.72	192.4	24.50	1.050	
	Additional Compounds																			
40	Acetylene	C_2H_2	26.036	11.91	-113.8	*-118.5	911	96.8	-	-	-	-	-	0.8989	68.62	-	-	-	-	0.407
41	Cyclohexane	C_6H_{12}	84.157	5.96	+43.5	+177.4	594	537.8	0.783	49.2	6.520	0.0093	7.747	2.9054	221.80	29.40	219.9	28.27	1.006	-
42	Methylcyclopentane	C_6H_{12}	84.157	5.96	-224.9	+161.4	-	-	0.754	56.2	6.277	0.0090	7.465	2.9054	221.80	28.00	209.5		1.040	-
43	Acetone	C_3H_6O	58.078	-	-138.3	133.7	691	455	0.798	44.5	6.696	0.0137	11.529	2.005	153.07	43.74	327.2			-
44	Diethyl ether	$C_4H_{10}O$	74.120	-	-177.3	94.3	523	381	0.719	65.2	7.194	0.0098	9.706	2.5589	195.35	36.83	275.5			-
45	Phenol	C_6H_5OH	94.108	-	+108.5	358.6			1.081	-0.6	6.227	0.0115	6.617	3.2488	248.02	25.11	187.8			-
	Diesel Standards																			
46	Cetane	$C_{16}H_{34}$	226.432	5.62	+64.6	536.0	222	862	0.779	50.1	6.486	0.0034	2.864	7.817	596.77	10.87	81.3			
47	Cetene	$C_{16}H_{32}$	224.416	5.96	+39.2	525.2			0.788	48.1	6.560	0.0035	2.923	7.7476	591.46	11.09	83.0			
48	Alpha-Methylnaphthalene	$C_{11}H_{10}$	142.190	13.11	-7.6	469.4			1.028	6.2	8.562	0.0072	6.022	4.9089	374.75	22.85	170.9			
	Alcohols																			
49	Methyl Alcohol	CH_3OH	32.042	-	-144.0	148.1	1157	464.0	0.796	46.3	6.627	0.0248	20.682	1.1062	84.45	78.47	587.0	76.93	1.02	0.390
50	Ethyl Alcohol	C_2H_5OH	46.069	-	-179.1	173.3	927	469.6	0.793	46.82	6.607	0.0172	14.342	1.5905	121.42	54.42	407.1	53.35	1.02	0.406
	Miscellaneous								*											-
51	Carbon	C	12.010	-	+6300	-	-	-	-			-	-	-	-					
52	Hydrogen	H_2	2.016	-	-434.4	-422.9	188	-399.8	0.071					0.0696	5.313				0.9993	3.4
53	Oxygen	O_2	32.000	-	-361.1	-297.4	730	-181.8	1.140					1.1048	84.34				1.00075	0.218
54	Nitrogen	N_2	28.016	-	-345.6	-320.4	492	-232.8	0.808					0.9672	73.84				1.0003	0.248
55	Carbon Monoxide	CO	28.010	-	-340.6	-313.5	514	-218.2	0.801					0.9670	73.82				1.0012	0.248
56	Carbon Dioxide	CO_2	44.010	-	-	-109.3	1073	+88.0	(1.56 soli					1.5194	115.99				1.0058	0.199
57	Hydrogen Sulphide	H_2S	34.076	-	-121.9	-76.5	1306	+212.7	0.799	47.6	6.580			1.1763	89.79	73.28	548.2	72.48	1.0110	0.254
58	Sulphur Dioxide	SO_2	64.06	-	-98.9	+14.0	1230	+424.9	1.460	-	-			2.2122	168.88				1.0108	0.152
59	Water	H_2O	18.016	-	+32.0	+212	3206	+705.4	0.999	10.0	8.328			0.6220	47.482	175.39	1312.1	173.74	1.0095	0.458
60	Air	-	28.956	-	-	-317.7	547	-221.3	0.856					1.0000	76.341				1.00039	0.241

* Sublimes

* Densities at B.P. except for water

** $Y = \frac{RT}{Pv}$

Hydrocarbons and Miscellaneous Compounds

Specific Heat at 760 mm. & 60°F.			Heat of Combustion (Dry Basis)						Heat of Vaporization at 760 mm. & B.P., Btu/Lb.	Heat of Fusion at 760 mm., Btu/Lb.	Air Required for Combustion		Inflammability Limits Vol. % in Air Mixture		Refractive Index n_D^{20}	Aniline Point °F.	Octane Number		Compound	No.
			Gaseous State PERFECT GAS				Liquid State													
Gas			B.t.u./Lb. Vapor		B.t.u. per Cu.Ft. Vapor		B.t.u./Gallon				Lbs. per Lb.	Cu.ft/Cu.ft. (Perfect Gas)	Lower	Higher			Motor Method	Research Method		
C_v	C_p/C_v	C_p Liquid	Gross	Net	Gross	Net	Gross	Net												
0.405	1.309		23,920	21,540	1,011	910	-	-	245	25.2	17.20	9.53	5.0	15.0		-	100+		Paraffin Series C_nH_{2n+2} Methane	1
0.346	1.198		22,350	20,450	1,770	1620	73,390	67,110	211	40.9	16.06	16.67	3.22	12.45		-	100+		Ethane	2
0.324	1.161		21,690	19,960	2,520	2319	91,330	84,000	180	34.4	15.65	23.82	2.37	9.50		-	99.5		Propane	3
0.312	1.144	0.55 @ 32°F	21,340	19,700	3,266	3014	102,990	95,010	166	32.4	15.43	30.97	1.86	8.41		181.2	90.5		n-Butane	4
0.312	1.144	0.55 @ 32°F	21,290	19,650	3,261	3010	94,620	91,610	158	-	15.43	30.97	1.80	8.44		225.7	97.0		Isobutane	5
0.309	1.121	0.64	21,120	19,540	4,016	3714	109,980	101,660	153	49.9	15.30	38.11	1.40	7.80	1.3577	159.3	61		n-Pentane	6
		0.53	21,060	19,470	4,004	3702	108,690	100,970	146	30.4	15.30	38.11	1.32	-	1.3540	168.3	89		Isopentane	7
		-	20,990	19,400	3,990	3689	-	-	136	-	15.30	38.11	-	-	1.3390				2,2-Dimethyl Propane	8
0.305	1.113	0.536	20,970	19,480	4,762	4410	114,910	106,350	146	65.0	15.21	45.26	1.25	6.90	1.3750	155.5	25		n-Hexane	9
		-	20,853	19,300	4,756	4384	112,620	104,200	138		15.21	45.26	-	-	1.3689	*178.1	94		2,2-Dimethyl Butane	10
		-	20,890	19,340	4,744	4392	115,220	106,620	137		15.21	45.26	-	-	1.3751	*161.4	95		2,3-Dimethyl Butane	11
		-	20,910	19,360	4,748	4396	113,720	105,240	140		15.21	45.26	-	-	1.3716	*165.0	73		2-Methyl Pentane	12
		-	20,920	19,370	4,751	4399	115,690	107,070	141		15.21	45.26	-	-	1.3766	*156.8	75		3-Methyl Pentane	13
0.302	1.109	0.529	20,860	19,340	5,508	5106	118,470	109,760	138	59.6	15.15	52.41	1.00	6.0	1.3878	159.1	0	0	n-Heptane	14
		0.519	20,820	19,300	5,498	5097	117,400	108,750	-	38.2	15.15	52.41			1.3850	165.2	45		2-Methyl Hexane	15
0.300	1.100	0.517	20,780	19,270	6,254	5802	121,270	112,440	131	77.7	15.10	59.55	.95	-	1.3976	161.1	-17		n-Octane	16
		0.492	20,560	19,060	6,190	5736	119,120	110,410	117	34.0	15.10	59.55			1.3915	*176.8	100	100	2,2,4-Trimethyl Pentane	17
0.299	1.093	0.518	20,710	19,220	7,000	6496	123,470	114,530	125	74.0	15.06	66.70	.83	-	1.4056	166.1	-28		n-Nonane	18
0.298	1.084	0.517	20,660	19,180	7,745	7192	125,260	116,330	120	87.0	15.04	73.85	.67	-	1.4120	171.5	-53		n-Decane	19
0.288	1.258		21,650	20,300	1,601	1500	70,910	66,430	208	51.4	14.76	14.29	2.75	28.60				100	Olefin Series C_nH_{2n} Ethene	20
0.298	1.180		21,060	19,700	2,335	2184	87,740	82,030	189	31.0	14.76	21.44	2.00	11.10				100	Propene	21
0.303	1.145	0.54	20,860	19,500	3,084	2883	105,480	96,580	174	-	14.76	28.58	1.70	9.00			80		Butene-1	22
		0.52	20,800	19,440	3,074	2874	-	-	187	56.1	14.76	28.58					83		cis Butene-2	23
		0.55	20,770	19,410	3,071	2870	-	-	183	75.6	14.76	28.58					83		trans Butene-2	24
		0.555	20,740	19,380	3,066	2865	-	-	167	45.4	14.76	28.58					87		Isobutene	25
		-	20,720	19,360	3,829	3578	110,850	103,580	148	46.3	14.76	35.73	1.60	-	1.3714	66.2		93	Pentene-1	26
		0.515									14.76	35.73			1.3797	64.4		98	Pentene-2	27
		0.508									14.76	35.73			1.3676				2-Methylbutene-2	28
		-									14.76	35.73			1.3677				3-Methylbutene-1	29
		0.506	20,630	19,270	4,375	4274	115,660	107,980	149		14.76	42.88			1.3886	73.0		80	Hexene-1	30
		0.488	20,560	19,200	5,320	4969	119,180	111,240	149	55.5	14.76	50.02			1.3999	81.0		54	Heptene-1	31
		0.486	20,510	19,150	6,066	5664	121,960	113,810	129		14.76	57.17			1.4103	*89.2		39	Octene-1	32
		0.485	20,480	19,120	6,811	6359	-	-			14.76	64.32			1.4161	100.4		-	Nonene-1	33
		-	20,440	19,080	7,556	7054	-	-			14.76	71.45			1.4259	*114.7		-	Decene-1	34
		0.414	18,225	17,490	3,750	3600	132,810	127,410	170	54.9	13.25	35.70	1.41	6.75	1.5012				Aromatic Series C_nH_{2n-6} Benzene	35
		0.397	18,470	17,640	4,480	4280	132,800	126,790	156	31.0	13.35	42.88	1.27	6.75	1.4969				Toluene	36
		0.404	18,680	17,780	5,226	4970	134,240	127,720	147	46.5	13.65	50.02			1.4974				m-Xylene	37
		0.412	18,780	17,880	5,250	5000	136,360	129,740	149	52.8	13.65	50.02	1.0	6.0	1.5055				o-Xylene	38
		0.402	18,620	17,720	5,210	4956	133,110	126,620	146	68.5	13.65	50.02			1.4962				p-Xylene	39
0.321	1.269	-	21,580	20,850	1,489	1439	-	-	296	-	13.25	11.91	2.5	80.0	-	-	-		Additional Compounds Acetylene	40
-	-	0.429	20,290	18,930	4,500	4200	131,180	122,320	154	13.3	14.76	42.88	1.33	8.35	1.4263	85.8	77		Cyclohexane	41
-	-	0.447					125,850	117,320	154	35.1	14.76	19.06			1.4098	93.2			Methylcyclopentane	42
-	-	-					88,560	81,970	224	42.2	9.51	28.59			1.3591				Acetone	43
-	-	-					93,770	86,070	151	-	11.17	33.35			1.3497				Diethyl Ether	44
-	-	-					126,450	119,140	-	52.2	10.27	33.35							Phenol	45
			*20,360	*18,920	-	-	-	-	76	112	14.93	116.72			1.4344				Diesel Standards Cetane	46
			20,316	18,957			131,990	123,070			14.76	114.34			1.4417				Cetene	47
			-	-	-	-	-	-			13.10	64.32							Alpha-Methylnaphthalene	48
.324	1.203	0.572	10,250	9,060	865	765	64,600	56,710	473	42.7	6.46	7.15	6.72	36.50	1.3288				Alcohols Methyl Alcohol	49
.359	1.130	0.553	13,150	11,910	1,596	1,446	84,290	76,080	368	46.4	8.39	14.30	3.28	18.95	1.3610				Ethyl Alcohol	50
-	-		*14,100																Miscellaneous Carbon	51
2.420	1.41		61,042	51,520	324	273	-	-	194	87.3	34.23	2.38	4.0	74.2					Hydrogen	52
0.155	1.401		-	-	-	-	-	-	92	5.9	-	-	-	-					Oxygen	53
0.176	1.404		-	-	-	-	-	-	86	11.0	-	-	-	-					Nitrogen	54
0.176	1.404		4,350	-	321	-	-	-	91	14.4	24.63	2.38	12.50	74.2					Carbon Monoxide	55
0.153	1.304		-	-	-	-	-	-	-	61.5	-	-	-	-					Carbon Dioxide	56
0.192	1.320		7,480	6,920	672	621	-	-	236	30.0	6.07	7.15	4.30	45.5					Hydrogen Sulphide	57
0.118	1.390		-	-	-	-	-	-	171	-	-	-	-	-					Sulphur Dioxide	58
0.343	1.335	1.000	-	-	-	-	-	-	970	143.0	-	-	-	-	1.3330				Water	59
0.171	1.410								92	-	-	-	-	-					Air	60

*Solid State

*Critical Solution Temperature

13. *Aniline point.*

The values given here are A.S.T.M. aniline[8] except those preceded by asterisks which are critical solution temperatures of the hydrocarbon in aniline. In general, the difference between the A.S.T.M. aniline point and the critical solution temperature is of the order of 1° F. or less for the hydrocarbons up to C_{10}.

14. *Octane number.*

The octane numbers chosen for inclusion represent the best available published information.

In working with pure compounds the use of Table 1 is straightforward, though possibly a word of explanation of the part played by the gas-law deviation factor is in order.

This quantity enters as a multiplying factor in gas metering and in calculating the actual heating value of a gas. For example, the volume of gas, Q_a, delivered by a displacement meter, is equal to the theoretical displacement, Q_t, multiplied by Y, the deviation factor, or, in the case of an orifice meter, the flow rate as given by the design of the meter on a perfect gas basis is multiplied by the square root of the factor, $\sqrt{Y}$. For a complete discussion of this phase of gas metering, reference should be made to the C.N.G.A. publication[9] on metering.

The calorific value of a real gas is the product of the heat of combustion in B.t.u. per cubic foot, as given in Table 1, multiplied by the gas-law deviation factor.

For high accuracy in fractional analysis by distillation, all gas volumes should be corrected for deviation from the perfect gas laws by applying the proper deviation factors. The method of adjusting gas volumes on this basis is discussed fully in a recent C.N.G.A. bulletin.[10]

Mixtures of compounds introduce thermodynamic complications, many of which can be overcome only by resort to direct experiment. For example, mixtures of certain of the hydrocarbons listed in the table with the alcohols will form azetropes, i.e., constant boiling mixtures.

Critical temperatures and pressures of mixtures are best obtained by experiment.

Where high accuracy is desired in problems involving density of mixtures of liquids the density should be measured. The reason for this becomes obvious when it is realized that a 50-50 volume per cent mixture of butane and decane, for example, will exhibit a contraction of approximately 0.6 per cent over the calculated specific volume. On the other hand, a mixture of benzene and *n*-hexane will undergo an expansion of 0.5 per cent over that calculated from the densities of the respective components in a 50-50 volume per cent mixture.

In essentially its present form Table 1 has found wide application in research and engineering activities of the company with which the authors are connected. Much constructive criticism was received from the members of the various technical staffs of the company and the physical constants committee of the California Natural Gasoline Association to whom grateful appreciation is extended.

Table 2—Bibliography Reference

No.	Compound	Melting Point	Boiling Point	Critical Pressure	Critical Temp.	Grams/Ml.	Gas Law Deviation Factor	Specific Heats Cp	Cv	Cp/Cv	Cp Liq.	Heat of Fusion	Heat of Vaporization	Heats of Combustion Gaseous	Liquid	Inflammability Limits
	Paraffin Series C_nH_{2n+2}															
1.	Methane	1	2	21	21	17,19	35,36	4	4	4	-	1	80	48	92	53
2.	Ethane	60	60	58	22	21	37	4	4	4	-	60	80	4,48	92	53
3.	Propane	59	59	23	23	7,27,61	7,27,38	4	4	4	-	59	80	4,48	92	53
4.	n-Butane	1	8,9,10	58	58	28	39	4	4	4	46	1	80	4,2	78	53
5.	Isobutane	2	8	21	21	2	29	4	4	4	46	-	80	4,74	92	53
6.	n-Pentane	3	11,12,13	21	21	12,13,30	40	4	4	4	40	1	81	4,48	78	53
7.	Isopentane	3	14	21	21	14,31	29	-	-	-	45	1	80	75,97	92	53
8.	2,2-Dimethyl Propane	67	2	77	77	71	-	-	-	-	-	-	80	75,76		-
9.	n-Hexane	3	11,13,15,16	21	21	15,16,31	29	4	4	4	47	1	80	4,48	78	53
10.	2,2-Dimethyl Butane	87	87	-	110	71		-	-				80	92,91	120	
11.	2,3-Dimethyl Butane	87	87	77	111	32		-	-	-	-		80	92,91	120	
12.	2-Methyl Pentane	32	3	-	77	32	-	-	-	-	-		80	92,91	120	
13.	3-Methyl Pentane	32	3	70	77	32	-	-	-	-	-		80	92,91	120	
14.	n-Heptane	3	13,18	24	24	13,30	29	4	4	4	45	1	80	4,48	46,78	53
15.	2-Methyl Hexane	3	3	77	77	7	-	-	-	-	45	1		92,91	95	
16.	n-Octane	3	11	21	21	71	34	34	34	34	47	1	80	75,48	47,78	53
17.	2,2,4-Trimethyl Pentane	3	3	21	21	33	-	-	-	-	45	1	80	92,91	79	
18.	n-Nonane	3	3	25	25	2	34	34	34	34	47	1	80	75,48	47,78	53
19.	n-Decane	1	11	25	25	6	34	34	34	34	47	1	80	75,48	47,78	53
	Olefin Series C_nH_{2n}															
20.	Ethene	66	66	21	21	34	6	4	4	4	-	56	66	4,77,49	91,92	53
21.	Propene	1	5	88	88	34	6	4	4	4	-	89	89	4,77,49	91,92	53
22.	Butene-1	64	5	-	25	8	34	4	4	4	64	-	45	4,77,49	91,92	53
23.	cis Butene-2	5	5	-	25	8	34				64	64	5	96		-
24.	trans Butene-2	5	5	-	25	8	34				64	64	5	96		-
25.	Isobutene	5	5	-	25	8	34				64	64	45	96		-
26.	Pentene-1	1	71	77	25	71	6				-	1	46	49,77,75	91,92	53
27.	Pentene-2	72	72	-	25	71	6				45	-				
28.	2-Methylbutene-2	2	71	-	-	71	-				45	-				
29.	3-Methylbutene-1	6	71	77	77	71	-					-				
30.	Hexene-1	68	68	-	25	71	-				46	-	83	49,77,75	91,92	
31.	Heptene-1	65	71	-	-	71	-				45	65	114	49,77,75	91,92	
32.	Octene-1	69	71	-	25	71	-				45	-	84	49,77,75	91,92	
33.	Nonene-1	-	2	-	77	71	-				45	-	-	49,77,75		
34.	Decene-1	82	2	-	-	71	-				-	-	-	49,77,75		
	Aromatic Series C_nH_{2n-6}															
35.	Benzene	1	77	21	21	117	6				44	1	80	91,92	90	53
36.	Toluene	1	77	21	21	117	6				45	1	46	91,92	90	53
37.	m-Xylene	115	77	77	25	117	6				45	1	46	91,92	90	-
38.	o-Xylene	1	77	77	25	117	6				45	1	46	91,92	90	53
39.	p-Xylene	1	117	77	25	117	6				45	1	46	91,92	90	-
	Additional Compounds															
40.	Acetylene	116	2	21	21	-	-	4	4	4			45	46		53
41.	Cyclohexane	3	3	21	21	77					44	1	46	92,94	90,91	53
42.	Methylcyclopentane	3	3	-	-	77					47	3	77		77	-
43.	Acetone	85	85	112	112	85,86						85	85		95	-
44.	Diethyl Ether	86	86	85	85	85,86							85		95	-
45.	Phenol	85	85	-	-	85						85			95	-
	Diesel Standards															
46.	Cetane	70	71	109	109	121						118		46		
47.	Cetene	71	2	-	-	71								49	91,92	-
48.	Alpha-Methylnaphthalene	2	2	-	-	2									-	-
	Alcohols															
49.	Methyl Alcohol	2	2	21	21	6	6				44	46	46	93,16,75	93,16,75	53
50.	Ethyl Alcohol	2	2	21	21	6	6				44	46	46	93,16,75	93,16,75	53
	Miscellaneous															
51.	Carbon	2	-									-		45		-
52.	Hydrogen	2	2	21	21	2	.6	45	45			46	6	44		53
53.	Oxygen	2	2	21	21	2	29	45	45			46	6			-
54.	Nitrogen	2	2	21	21	2	29	45	45			6	6			-
55.	Carbon Monoxide	6	2	21	21	2	6	45	45			46	6	50		53
56.	Carbon Dioxide	-	2	21	21	2	29	45	45			46	-			-
57.	Hydrogen Sulphide	80	80	21	21	62	29	45	45			20	20	57		53
58.	Sulphur Dioxide	2	2	21	21	2	6	45	45			-	46			-
59.	Water	2	2	26	26	2	6	45	45			46	46			-
60.	Air		2	21	21	2	35	34	45	65		-	6			-

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SUMMARY OF BASIC CONSTANTS

Gallons per cubic foot	=	7.481
Liters per cubic foot	=	28.316
Molecular weight of air	=	28.966
Density of water at 60° F.	=	0.99904
Volume of ideal gas, liters per mol at 0° C., 1 atm.	=	22.4140
Ice point, degrees Rankine	=	492
Grams per pound (adv.)	=	453.592

Table 2 (Continued) Bibliography of Physical Constants

Numbers

Refractive Index N_D^{20}	Aniline Point	Octane Number Motor Method	Octane Number Research Method	Reference Number	Author	Journal	Volume	Number	Page	Date
				1	Parks and Huffman	Ind. Eng. Chem.	23	10	1138	October, 1931
				2	-	Int. Crit. Tables	1			
				3	Smittenborg, J., Et. Al.	J. Am. Chem. Soc.	60	1	17	January, 1938
				4	Beeck, O.	J. Chem. Physics	4	10	680	October, 1936
				5	Kistiakowsky, C.B., Et. Al.	J. Am. Chem. Soc.	57	5	876	May, 1935
				6	Hodgman, C.D.	Phys. & Chem. Handbook, 20th Edition	-	-	-	1935
				7	Sage, Schaafsma, and Lacey	Ind. Eng. Chem.	26	11	1216	November, 1934
				8	Coffin and Maas	J. Am. Chem. Soc.	50	5	1427	May, 1928
				9	Cox, E. R.	Ind. Eng. Chem.	27	12	1423	December, 1935
				10	Sage, Webster, and Lacey	Ind. Eng. Chem.	29	10	1189	October, 1937
				11	Mair, B. J.	B. of S. Jr. of Res.	9	4	457	October, 1932
				12	Timmermans and Roland	J. Chim. Phys.	32	-	501	1935
				13	Shepard, Henne, and Midgely	J. Am. Chem. Soc.	53	5	1948	May, 1931
				14	Timmermans and Martin	J. Chim. Phys.	23	-	733	1926
				15	Cramer and Mulligan	J. Am. Chem. Soc.	58	2	373	February, 1936
				16	Timmermans and Martin	J. Chim. Phys.	25	-	411	1928
				17	Sage, Schaafsma, and Lacey	Ind. Eng. Chem.	26	2	214	February, 1934
				18	Beattie and Kay	J. Am. Chem. Soc.	59	9	1586	September, 1937
				19	Lacey, Sage, and Kircher	Ind. Eng. Chem.	26	6	652	June, 1934
				20	Giauque and Blue	J. Am. Chem. Soc,	58	5	831	May, 1936
				21	-	Int. Crit. Tables	3			
				22	Kay, W. B.	Ind. Eng. Chem.	30	4	459	April, 1938
				23	Beattie, J. A.	J. Chem. Physics	3	-	76	February, 1935
				24	Beattie and Kay	J. Am. Chem. Soc.	59	9	1586	September, 1937
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				37	Sage, Webster, and Lacey	Ind. Eng. Chem.	29	6	658	June, 1937
				38	Beattie, Kay, and Kaminsky	J. Am. Chem. Soc.	59	9	1589	September, 1937
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				41	-	J. Chim. Phys.	27	-	36	1930
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106	100		77	67	Aston and Messerly	J. Am. Chem. Soc.	58	12	2354	December, 1936
77	77		77	68	Waterman and de Kok	Rec. Trav. Chim.	52	-	251	1933
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Proper Operation of Wire Rope Prolongs Its Useful Life Part 1

By HARRY F. SIMONS

Save Steel for Ships and Shells

For the benefit of all wire-rope users the following suggestions are offered:

1. Keep your wire-rope-using equipment in good condition. Sheaves should be of proper size, design, material, and free from corrugations. Keep all sheaves properly lubricated and in line. Avoid excessive fleet angles.

2. Keep your wire ropes thoroughly and correctly lubricated.

3. Avoid kinks and sudden jerks; also, avoid crosswinding on drums, and reverse bends if possible.

4. Make sure your wire ropes operate with an adequate factor of safety. If there is not a proper ratio between the strength of the rope and the maximum load to be handled, the rope may be overstressed—a condition no rope can long survive.

5. Use wire rope of the correct size, construction, type, and grade for your particular conditions.

6. Purchase wire rope in sufficient length to allow for changes in position on drum.

WIRE rope is one of the most vital linkages on a drilling rig or a servicing unit; its failure means an absolute shutdown and may result in a loss of the hole. With plenty of steel available, the proper operation and maintenance of wire rope is extremely profitable. At the present time, with steel becoming more and more scarce, the care of this item is of primary importance.

In some respects, wire rope differs from other items of equipment. For instance, it would not be feasible to attempt to use a line which had already been discarded. Such a line would undoubtedly be corroded internally and would break under very light strain. Practical men in the field know this, for at some time or other they have probably had experience when attempting to use a new-appearing line which had been used a short time and then set aside for a considerable period.

Assuming that the proper size and length line has been selected and installed correctly there are only a few things the operator needs to do. These are:

1. To see that it is operated at the proper speed and that it spools smoothly.
2. To see that it is not overloaded.
3. To change positions on the drum at proper intervals and keep sheaves, etc. in good condition.
4. To lubricate it when necessary.
5. To inspect it at regular intervals.

Wire-line management can be used effectively to increase the service life of a rope. Constractors or oil companies having both deep and shallow operations can remove the lines from their deep-drilling equipment, when they are no longer safe, and put them in service immediately on the shallower wells.

A line whose safety factor has been reduced to three or two on a 10,000-ft. well would still have an adequate safety factor on a 4,000 or 5,000-ft. well.

Probably the greatest increase in wire service is available through more careful operation of the drilling rig. Running into the load (string of pipe) instead of picking it up smoothly puts an undue strain on the strands and individual wires. The point of application of this strain on a drilling rig is generally when the blocks are at their lowest or uppermost position. This will cause premature failure of a line due to concentration of the wear.

During the period of acceleration the tension on the rope is of the largest magnitude and the radial pressure of the rope on the groove surface within the sheaves is of the greatest value. During this period there exists a tendency for the rope to slip by the sheaves, which combined with the greater radial groove pressure, results in greater wear on the wires at these localized spots. This more rapid rate of wear will cause the outer wires on the strand crowns to break up sooner from bending fatigue at these localized spots.

Moderate Rate Pays Dividends

Sudden acceleration and deceleration also cause jumping and whipping of the line which, in turn, causes it to spool unevenly and ball up on the drum. The same effect is produced when the rig is operated at high speeds, particularly if the block is light. Much trouble can be avoided by running the hoisting machinery at a more moderate rate.

In many cases where the blocks are so light that trouble is experienced even at slower speeds, it has been found that a smooth spooling could be obtained by a gradual acceleration throughout ascent of the blocks.

Slight modifications of the operation often produce very satisfactory results. One of these is the changing of the position of the line guide. Originally these guides were located only a few feet above the drum at which point they were normally a great help but in other cases would not perform satisfactorily. By putting the guide 30 or 40 ft. above the drum, it has been found that whip can be reduced to the point where the line will spool smoothly. If the line continues to spool unevenly, it may be due to the manner in which the first layer of rope is placed on the drum. The pick-up point may be too close to the side of the drum, causing it to strike the flange and set up a vibratory wave. The pick-up point should never be closer than 2½ coils to the side of the drum. The fleet angle should also be checked if the line does not spool properly.

Avoid Overloads

Overloading a line is extremely harmful, although at times it may be necessary to do so. In case the drill pipe becomes stuck or there is any reason for greatly increasing the load on the blocks, the number of lines strung should be increased and the pull on the fast line reduced.

Continued loading and unloading of a wire rope results in ultimate deterioration due to the molecular disarrangement within the steel and the gradual breaking down of the hempen foundation caused by the elimination of the lubrication which maintains fiber pliability.

The molecular material disarrangement will not take place unless the rope is loaded to a point equal to or greater than the elastic limit of the material within the steel wires. When loaded below the elastic limit of the steel no permanent injury will result. However, when loaded above the elastic limit of the steel the wires will stretch and stay permanently stretched, unable to return to their original state. A wire rope should never be loaded up to or beyond a tension equal to 60 per cent of its rated breaking strength. It is not uncommon for this overloading to occur when indeterminate shock loads are applied to a wire rope which is normally operating under a low factor of safety.

The application of a load to a rope always translates itself into compressive forces of the outer strands onto the core and in the case of a hempen core the outer strands embed themselves into the core. This pressure combined with the movement of the strands around their respective

axes while the rope travels over sheaves causes the cutting and wearing of the individual fibers of the core.

The larger the applied load, the greater the compressive force exerted by the strands on the hemp core, and the greater the cutting action which takes place on the fibers within the core. With increasingly larger applied loads a point is reached where the hemp foundation breaks down prematurely, causing rapid failure of the wires within the rope.

The comparative life of a wire rope is almost directly proportionate to the factor of safety under which the rope operates. A wire rope operating with a factor of safety equal to six will last almost twice as long as wire rope operating with a factor of safety equal to three. This proportion holds true to lesser and lesser extent when making comparisons of wire ropes operating with safety factors larger than six.

The safety factor of operation of wire rope is the ratio between the rated breaking strength of a rope and the load applied to the rope. The applied rope load must be computed by always taking into consideration the increased loads due to starting and stopping, and frictional resistance.

Changing Position of Rope

Changing position of the wire on a drum is essential for satisfactory service because the first layer on the drum supports the load and because it is against an unyielding surface, it will be crushed. After the first layer of coils is crushed, the second and succeeding layers will not spool evenly. There is also the chafing at the major and minor crossovers of each layer of coils with the succeeding layer. This is obvious when it is recalled that the angle of the coils, with reference to the drum, changes with each succeeding layer.

As a length of wire rope is wound onto a hoisting drum each round of rope located in the second, third, fourth, etc. layers describe paths in each round subjected to a double bend as the rope round moves over from the groove formed between two adjacently located rope rounds in the underlying layer to the next groove.

On a hoisting drum containing parallel grooving the shift over from one groove formed between two adjacently located rope rounds to the next groove occurs with a single bend in the rope, the bend occurring over a longer arc of the round of rope.

The initial shift from groove to groove formed between rope rounds occurs when the rope climbs from the underlying layer to the next covering layer and starts to move away from the drum flange. This initial shift usually takes place quite forcibly with a very audible snap of the rope as it jumps into its forced position.

These crossovers of the rope as it overwinds on a drum tend to localize greater accelerated wear in spots. By periodically cutting back on the drum end a length of rope equal to a fraction of the distance between worn spots or a length of rope equal to the distance between the worn spots plus a fraction of this distance the localized wear may be distributed throughout a greater length of rope and thereby the useful rope life will be increased.

Most operators of deep wells buy drilling lines long enough to have considerable reserve and allow for a number of drum-position changes. These changes are made about once a week or oftener if the number of trips is increased. An increase in the length of rope purchased will repay its cost many times over. Be sure to seize the line before cutting it. (The Oil and Gas Journal, April 30, 1942, p. 146.)

In this connection, it might be well to point out that a proper method of attaching a dead line is essential if this procedure is to be followed. The dead line should be attached so there are no kinks placed in it, the best method being to use one of the modern anchoring devices which are nothing more than a stationary sheave. If a kink is placed in the line by running it around a joint of pipe and then clamping it, this portion of the line will wear rapidly when it is placed in service.

When rope deterioration is more severe on one end than the other, greatly increased rope life will result by turning the rope end for end after it has delivered approximately one-half the expected life. This deterioration might be due to severe bending over sheaves or it might be due to the constant heavy application of loads. This is particularly true of cable-tool drilling lines as well as rotary drilling lines. One contractor has devised a system whereby he can change ends of the line without unstringing the blocks.

The occasional touching up of all drum and sheave grooves to maintain smooth groove walls will prove in the long run to be an economical precautionary measure.

The prevention of groove wear is best solved by the use of the correct type of material for sheaves and drums. To prevent groove wear usually means longer life both for the equipment and also the ropes. The use of manganese steel for sheaves is highly recommended and the addition of molybdenum or nickel to the steel used for drums and sheaves has proven by experience to produce economical results.

Lubrication

There are comparatively few operators who follow a standard lubrication program. Most wire lines are built with enough internal lubrication to prevent chafing of the inner wires. The lubrication on the outside, however, is often thrown off, and the line will become dry and will be subject to corrosion and abrasion. Whenever a casual inspection of the line shows that the outer wires are rusting, or are chafing, it should be lubricated. This will be most noticeable a few hours after a rain.

There are several methods of lubricating a line. The first is to build a funnel which will go around the line into which the lubricant can be poured. Another method is to apply the lubricant with a point brush. It can also be pulled through a trough filled with lubricant.

Inactive Ropes and Corrosion

Corrosion strikes inactive ropes quickly, unless they are adequately protected by thorough lubrication. Be sure ropes are thoroughly lubricated immediately when taken out of service. This protects the entire rope against all elements.

Effect of Corrosion

If wire rope is allowed to corrode:

1. Tensile strength is decreased.

2. Resistance to fracture from bending is diminished.

3. Resistance to impact, or shock loading is diminished.

If corrosion of wire, or rope, is allowed to continue for any period of time, the useful life is completely destroyed. Frequent application of a lubricant will prevent formation of rust which tends to bind a rope mechanism together, with subsequent great loss in strength and rope life. The strength of a rusty rope may be raised 25 to 30 per cent in value by lubricating the rope and liberating the bound structure. For field application it is usually necessary to use a lubricant which is fluid at ordinary room temperature and which possesses a high penetrating quality with some lubricating quality.

In cases where the rope is working in a very moist atmosphere it is highly advisable to prevent the formation of a coating of hydrated rust on the wires by very frequent applications of lubricant. A hydrated-rust coating is slimy and cannot be removed until the rope is thoroughly dried out.

The application of any type of lubricant on top of a coating of hydrated rust does absolutely no good, and if it forms it is necessary that the rope be thoroughly dried before any lubricant will take effect.

For field application, suggestions are:

(*a*) Rope lubricant of a reputable manufacturer.

(*b*) Fifty-fifty mixture of red engine oil and boiled linseed oil.

(*c*) Red engine oil.

(*d*) Discarded crankcase oil.

(*e*) The same lubricant as applied during manufacture.

Careful handling of wire rope while moving is important if long life is to be obtained. Device shown is used to spool the drilling line on a reel when a heavy servicing unit is to be moved

Desulfurizing Properties of Zinc Hydroxide

By K. A. MUSATOV and L. G. KRYMOVA†

SUMMARY

Since desulfurizing light petroleum distillates, especially gasoline, is of primary importance at this time in order that motor and aviation gasolines show the highest possible responsiveness to lead tetraethyl, this presentation commands an unusually timely interest. The authors have shown that zinc hydroxide is an especially efficient reagent in removing sulfur from gasolines and other light petroleum fractions.

THE basic products of the hydrolysis of zinc chloride [ZnO and Zn (OH_2)] are of primary importance in the desulfurization of distillates and for combination with any hydrogen sulfide formed.* This was investigated further. In the preparation of the catalyst, attention was paid to the complete elimination of hydrolysis of the salt by precipitating zinc chloride on carbon from a hydrochloric acid solution (and not from an aqueous solution, as usual) with subsequent drying of the entire mass in a stream of dry, hot hydrogen chloride. At the same time pure zinc hydroxide was prepared without traces of $ZnCl_2$. The substances were used in comparative experiments on desulfurization of Ishimbaevo naphtha. The sulfur contained in the distillates is shown in Table 1.

TABLE 1—COMPARATIVE DESULFURIZATION OF NAPHTHA

No. of expt.	Desulfurizing agent:	Per cent S in distillate: Before expt.	After expt.	Remarks
1	Empty tube	1.19	0.760	.....
2	Wood charcoal	1.19	0.680	Temp.
3	Zinc chloride, free from oxides, or carbon	1.19	0.700	.....
4	Zinc hydroxide on carbon	1.19	0.130	360° C.
5	Zinc hydroxide without carrier	1.19	0.065	.....

From Table 1 we see that the desulfurization in an empty tube, with carbon and in a tube with zinc chloride (without oxide) are very similar, the results with pure carbon and zinc chloride practically coincide. The role of zinc chloride itself in the desulfurization is thus negligible. A sharp lowering of the sulfur content is caused by zinc hydroxide. The lowering is of such magnitude that it was investigated as an independent desulfurization reagent.

Desulfurization with zinc hydroxide may be carried out by continuous or batch processes. The first has unquestionable technological advantages, the second is more flexible under laboratory conditions. The substitution of oxides of copper, lead and iron used in the Frasch method, with zinc chloride gives not only a better desulfurization of the distillate and gas but it also makes possible a much more complete use of the reagent. It also gives a considerable decrease in volume of the reaction space and allows application of this method to a greater variety of distillates including such difficultly refinable substances as the distillates of crude oils from the Ural-Volga area ("Second Baku").

Equipment, reagent, and raw material.

A glass tube placed in a vertical position and heated with an electric resistance furnace was used for the desulfurization. The lower end of the tube through which the raw material was admitted was filled with broken glass and was used as the vaporizer and steam superheater. The middle section and the upper end were the reactors and they were filled with slightly compressed solid zinc hydroxide in coarsely granular form. The tube was 400 mm. long and 35 mm. in diameter.

Zinc hydroxide was prepared (1) by precipitation of a solution of zinc chloride by ammonia, followed by washing of the hydroxide or (2) by boiling of an aqueous solution of ammonium zincate $[(Zn(ONH_4)_2]$. The latter was prepared by dissolving zinc oxide in a strong aqueous solution of ammonia.

The zinc hydroxide was pressed slightly to remove the water, followed by drying of 120° C. and breaking up into coarse granules. Granules 1-1.5 mm. in diameter were used in the experiments.

The raw material used in the desulfurization was a distillate from Ishimbaevo crude oil (Ural-Volga area), namely gasoline and kerosene. Most experiments were carried out with the naphtha cut with a boiling point of 130°-230° C. The original naphtha contained 1.19 per cent sulfur (by the lamp method). The sulfur was distributed as follows (in per cent):

Disulfide sulfur	0.37
Sulfide sulfur (according to Faragher)	0.14
Residual sulfur	.068
Total	1.19

TABLE 2—LOWERING OF THE SULFUR CONTENT OF NAPHTHA

No. of expt.	Temp. (°C.)	Per cent sulfur in the distillate: Control distns. without reagent	Expts. with Zn(OH)₂	Remarks:
0	...	1.19	....	Original naphtha
1	20	1.062	1.062	Expt. in liq. phase
2	200	....	0.220	
3	250	0.760	0.140	
4	300	....	0.130	
5	350	....	0.065	Experiment in the vapor phase
6	375	0.460	0.086	
7	400	....	0.129	
8	500	....	0.260	

Temperature

The desulfurization temperature was investigated within the range of 20°-500° C. The desulfurization of naphtha carried out in the liquid phase at room temperature (20° C.) was done by careful agitation with a hydroxide ground to a powder. The naphtha was decanted after settling, followed by redistillation and determination of sulfur. The desulfurization at higher temperatures (beginning with 200° C.) was carried out in the vapor phase and in the glass tube described above. Control experiments (with an empty tube) were carried out at different temperatures. Results obtained are summarized in Table 2.

The temperature of 150° C. probably marks the beginning of the thermal dissociation of petroleum sulfur compounds, and, as we may see from Table 2, a great part of the sulfur has already combined with the hydroxide at a temperature of 200° C. (only 0.22 per cent remains out of the original 1.19 per cent). With an increase in temperature and consequently with an increase in the thermal dissociation of the sulfur compounds, there is observed a decrease of the sulfur content of the naphtha after treatment with zinc hydroxide. The desulfurization curve, however, has a maximum (the maximum temperature of desulfurization with hydroxide) at 350°-370° C. Such a result can be explained by two assumptions: (1) A rapid loss of the water of constitution of the hydroxide takes place with an increase in temperature with conversion into the oxide, the latter being less active toward sulfur than the hydroxide form; (2) with increase in temperature, cracking of the hydrocarbons sets in, leading to a regrouping of the radicals and to the formation of sulfur compounds having greater thermal stability.

These two assumptions are confirmed by experiments carried out on the desulfurization of naphtha with zinc hydroxide and with pure zinc oxide, and on desulfurization of straightrun gasoline and cracked gasoline of identical boiling range (40°-130° F.) with zinc hydroxide.

Data dealing with the aforesaid are presented in Table 3.

TABLE 3

No. of expt.	Reagent:	New material used in cracking	Per cent sulfur: Before	After	Remarks
1	Zinc hydroxide	Naphtha	1.19	0.065	Exptl. temp. 360°C.
2	Zinc oxide	Naphtha	1.19	0.215	
3	Zinc hydroxide	Str.-run gaso.	0.40	0.00	
4	Zinc hydroxide	Crckd. gaso.	0.40	0.16	

Capacity of the reactor and the duration of the activity of zinc hydroxide.

Zinc hydroxide not only combines with the sulfur in the distillate but also adsorbs resins. In the continued use of a single batch of zinc hydroxide the latter gradually darkens, changing from gray to black. Simultaneously there is observed a lowering of its desulfurization activity. The activity of the reagent decreases with increase in the content of sulfur in the original distillate.

*The mechanism of desulfurization of distillates with zinc chloride. Journal Applied Chemistry, U.S.S.R. 13, 227-34 (1940).

†Note: This article was translated by A. A. Boehtlingk in Foreign Petroleum Technology from the original by K. A. Musatov and L. G. Krymova in Journal of Applied Chemistry, U.S.S.R. 13, 1804-1809 (1940), and has been edited for the sake of clarity. It is submitted by the Petroleum Division of the American Chemical Society. The facts and opinions presented are solely those of the authors cited in the references, and the Petroleum Division does not necessarily endorse the statements made.

When feeding naphtha with a velocity of 50 ml. per hour at a reaction capacity of 250 ml. (capacity of 1/5 of the reactor per hour) the sulfur content in the individual fractions of the distillate decreased in the order shown in Table 4.

TABLE 4—LOWERING OF THE SULFUR CONTENT OF NAPHTHA (CONSECUTIVE PORTIONS OF THE DISTILLATE)

No. of smpl.	Ratio of desulfurized naphtha to the reagent by vol	% S remaining in dist.	Remarks:	
0	Original material	1.19	Undistilled naphtha	
1	1/25	0.045	First 10 ml.	Temp. of expt. 360°C.
2	1/2	0.065	First 100 ml.	
3	1	0.090	First 200 ml.	
4	2	0.100	First 400 ml.	
5	4	0.135	First 800 ml.	

Mixt. of all batches (in volume).

In contrast to the hydroxides of the heavy metals, zinc hydroxide has the ability to not only desulfurize but also of maintaining this property for a long period of time. Pressed zinc hydroxide has a bulk specific gravity of 0.4. The compactness of the reagent, its activity and "tenacity" permits this work to be carried out in small volume reactors.

Gases and material balance.

Solid zinc hydroxide reacts with hydrogen chloride and with hydrogen sulfide. Under dry reaction conditions at a temperature of 360° C. the presence of gaseous HCl does not prevent the formation of zinc sulfide. In the desulfurization of naphtha and crude oil as a whole, the gases obtained do not contain appreciable quantities of hydrogen sulfide nor of hydrogen chloride.

The ability of solid zinc hydroxide to absorb simultaneously both gases (H_2S and HCl) may be of great practical importance in combating corrosion in the distillation of crude oils containing troublesome amounts of sulfur.

In the case of a fresh charge, when the absorption is relatively high, the losses of the distillate frequently amount to 4 per cent of the original raw material during the first 4 hours, decreasing upon further treatment to 1.5-2 per cent, and approaching the losses in the usual distillation. In continuous work with naphtha, in its desulfurization down to 0.1 per cent of sulfur, the losses of the distillates amount to 1.5-2 per cent and the consumption of the hydroxide under laboratory conditions reaches 10 per cent, based on the naphtha. In the case of a prolonged run the losses of distillate are stabilized and the consumption of the reagent decreases in proportion to the period of its use (amount of raw material fed). The theoretical limit for reagent consumption can be calculated from the reaction $Zn(OH)_2 + H_2S = ZnS + 2H_2O$.

Most of the reagent is converted into zinc sulfide during the run. The latter is the original material for the preparation of zinc oxide and its hydroxide. In burning, zinc sulfide is converted into the oxide with the separation of sulfur dioxide gas. Zinc oxide is dissolved in the cold in a strong solution of ammonia with the formation of ammonium zincate. Ammonium zincate separates zinc hydrate from the solution on heating.

$$Zn(OH)_2 + H_2S \rightarrow ZnS + 2H_2O$$
$$ZnS + 3O \rightarrow ZnO + SO_2$$
$$ZnO + 2NH_4OH \rightarrow Zn(ONH_4)_2 + H_2O$$
$$Zn(ONH_4)_2 \rightarrow Zn(OH)_2 + 2NH_3$$

The sulfur dioxide gas formed in the regeneration may be used for preparation of sulfuric acid.

Lowering the sulfur content of individual fractions.

In addition to the naphtha used for the development of the method, the following fractions of the same crude oil were subjected to desulfurization with zinc hydroxide: gasoline with an end point of 130° C., kerosene with a boiling range of 200°-300° C., crude oil as a whole, and also cracked gasoline and cracked naphtha. The degree of desulfurization of these fractions is shown in Table 5.

TABLE 5—LOWERING THE SULFUR CONTENT OF CRUDE-OIL FRACTIONS BY MEANS OF ZINC HYDROXIDE

No.	Fraction:	Per cent S in distillates: Before desulfurization	After desulfurization
1	Gasoline	0.40	0.00
2	Naphtha	1.19	0.06
3	Kerosene	1.75	0.46
4	Cracked gasoline	0.40	0.16
5	Cracked naphtha	...	0.42
6	Crude oil as a whole	2.3	1.00

From these data we see that the gasoline can in some cases be entirely freed from sulfur by means of zinc hydroxide, and that it is possible to obtain a naphtha with a lower sulfur content than is required by specifications and that the sulfur content in kerosene can be lowered by 65 per cent. The figures for crude oil as a whole, where the sulfur content was lowered 2.3 fold, show further possibilities for desulfurization by means of the hydroxide.

Continuous desulfurization with zinc hydroxide.

The continuous desulfurization with zinc hydroxide may be carried out with the "liquid" as well as with the solid reagent. When working with the "liquid" reagent, it is more convenient to use an aqueous solution of $Zn(ONH_4)_2$. The latter may be pumped continuously with the petroleum product through a tube still where, in the heating zone (up to 100° C.), ammonium zincate will decompose into zinc hydroxide and ammonia. The neutralization of sulfur compounds will in this case take place in the tube itself. The reacted hydroxide in the form of zinc sulfide, will be carried off into the evaporator. Ammonia, after passing the entire length of the oil distillation equipment, will leave the gas separator together with the hydrocarbon gases and may be removed from the latter by washing with water. The solid zinc hydroxide may be pumped, in the same way, in the form of a suspension. Ammonia is not separated in the system under these conditions.

In semicommercial desulfurization plants for continuous desulfurization, ammonium zincate was continuously fed into the reactor together with the vapors of the distillate (the distillate vapors and those of the zincate solution were admitted into the reactor through a nozzle in such a way that the vapors atomized the zincate and thus facilitated its rapid conversion into the hydroxide and mixing of the reagent with vapors). The zinc sulfide formed remained in the reactor while the vapors of the distillate were rectified and condensed. Such a modification gave a lowering of the sulfur content of the naphtha from 1.19 to 0.27 per cent.

Conclusions

The following has been established experimentally:

1. In the presence of pure zinc chloride, catalytic desulfurization does not take place. The observed lowering of the sulfur content of the distillate is due to the reaction between products of hydrolysis of the zinc chloride and products resulting from thermal decomposition of the sulfur compounds.

2. Zinc hydroxide desulfurizes the distillates more thoroughly than zinc oxide.

There is a maximum temperature for the desulfurization with zinc hydroxide which is determined by the degree of thermal dissociation of the sulfur compounds in the distillate and the ease of decomposition of the hydroxide into the oxide and water.

The maximum desulfurization temperature with zinc hydroxide at atmospheric pressure occurs at 360°-370° C. for crude oil distillates.

3. In desulfurization with zinc hydroxide, hydrogen sulfide and hydrogen chloride combine with the zinc hydroxide.

4. Zinc hydroxide desulfurizes petroleum fractions more completely the lower their boiling points. Gasoline and naphtha can be desulfurized very thoroughly.

Rules for Gage Installation and Use

LENGTH of service obtained from pressure gages of all types is determined to a great extent on the selection of the right gage for the job and on the manner in which it is installed.

1. Gages should be graduated to approximately double the operating pressure. If a gage is to be subjected to a 100-lb. average operating pressure, a 200-lb. dial graduation should be employed. The reserve capacity will assure longer life and greater accuracy.

2. Gages should never be subjected to a pressure greater than the total dial graduation.

3. A vacuum gage should not be used on pressures above atmosphere and a pressure gage should not be subjected to a partial vacuum. A compound pressure and vacuum gage should be used when these conditions are likely to occur.

4. Gages used on steam should be protected from excessive temperature by installation of a siphon between gage and source of pressure.

5. Sudden application or relief of pressure and pressure pulsations should be carefully guarded against to assure long, accurate service. The gage cock or a suitable valve can be used for throttling and a receiver can be employed to reduce pulsation. Gages with a restricted orifice in the connection reduce pointer fluctuation to a considerable extent.

6. Mechanical vibration must be avoided in so far as possible.

7. Plain case gages should be installed and tightened by applying a wrench to the pressure connection and should never be tightened by using the case as a lever.

8. If a liquid column is allowed to act on a gage, indicating a gas (air, steam, etc.) pressure, a correction for the effect of the static head of the liquid column should be made by removing the indicating pointer and resetting it to zero, with the connecting piping full of liquid and gas pressure removed.

Due to rough handling or unusual service conditions, the pointer of a gage may stand away from zero when there is no pressure on the gage. Ordinarily the gage will be found inaccurate to approximately the extent of this variation from zero. If service conditions require great accuracy, it would be advisable to recalibrate the gage completely. For other service, commercial accuracy would result from the removal of the pointer and resetting to zero. The ring and glass of the gage should be removed. A suitable hand jack or hand puller will permit the easy removal of the pointer. With the gage held in vertical position, the pointer should be carefully replaced at the zero position on the dial. A pointer driver should be used to fasten the pointer securely to the pinion to the pinion shaft—only a few light taps on the driver is required. Replace glass and ring and the gage is ready for service.

QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

100-Octane Plant Capacity Today

We are contemplating producing 100-octane gasoline and do not know how much gasoline will be required. Can you indicate how much such gasoline will be wanted?—B. L. B.

The Office of the Petroleum Coordinator has not of late disclosed the precise plans of the Government with respect to the capacity of 100-octane plants. In about 1933 the hydrocarbon 2,2,4-trimethylpentane known as isooctane, gained recognition because of its ability to allay engine detonation and it was adopted as a standard having an octane number of 100, along with normal heptane at an octane number of zero. By 1935 methods were developed by research, for commercial production of 100-octane-number fuels aimed mainly at producing the hydrocarbon known as isooctane, and the U. S. Army adopted a 100-octane fuel specification. Yearly production of 100-octane fuels has been somewhat as follows:

Year	Production of 100-octane fuel, percentage of normal total gasoline
1930	None
1933	Laboratory preparations
1935	0.5 per cent polymers and alkylates in pilot-plant operations
1940	1.1 per cent mainly in semiplant-scale operations
1941	1.3 per cent
Now	Over 2.5 per cent
Contracted	Over 10 per cent

Public statements have not been made recently, but opinions have been stated that the present production of 100-octane fuel is about 80,000 bbl. per day and that the total production now contracted amounts to about 280,000 bbl. per day. These plants are to be completed in about a year from date of contract and as this is written no more plants are contemplated. The goal may, however, be increased at any time because in the past the program has been progressively increased from 40,000 to 120,000, 180,000 and finally 200,000 bbl. as the latest official announcement.

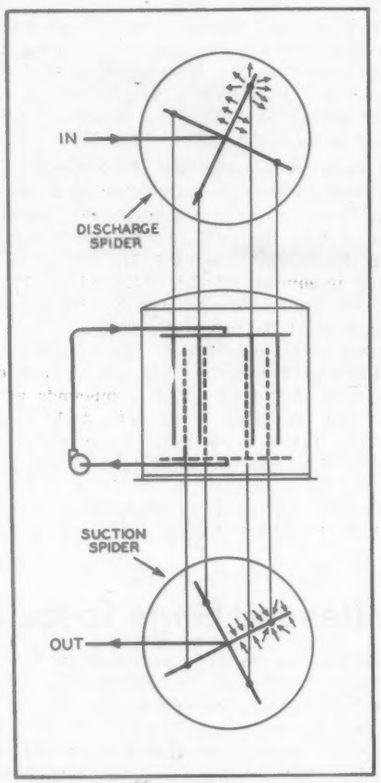
The public can only speculate on the final need for 100-octane fuel. Most of our fighting planes have 1,200-hp. or larger engines, and the large bombers have four such engines. Such an engine would use 75 to 115 gal. per hour, or 43 to 66 bbl. per day of 24-hour flight. Thus the number of fighter-plane engines that could be kept continuously in the air on a production of 200,000 bbl. per day would be about 3,600. Finally the average horsepower per plane is nearer 2,400 and hence the number of planes up at any moment during the day could be about 1,800-2,000.

Theory of Circulation For Tank Mixing

Will you please outline a suitable means of circulating material in and out of a tank for the purpose of mixing the ingredients of the tank, for example, lead fluid and gasoline?—I. A. A.

In most actual installations refiners have simply introduced the circulating fluid into the top of the tank by means of a spider spray and have picked up suction for the circulating pump from a similar perforated spider at the bottom of the tank. Such is probably adequate because of the fact that the installation is cheap and because some of the holes in the spider soon become plugged and therefore a more elaborate scheme of circulation is not practical.

Nevertheless, from the standpoint of theory, the system should be arranged so that suction is taken in all parts of the tank and the return discharge is admitted at all parts of the tank. One turnover of the tank contents by such a circulation system (barring channeling) would result in complete mixing of the entire tank contents. An attempt to attain such a theoretically perfect system is indicated in the sketch on this page.



Operation of Gasoline Plants For Propane

We wish to start making propane in our gasoline plant. Can you tell us anything of the new operation?—B. W.

The production of propane is more complicated than might be supposed. After having absorbed the propane by the use of additional oil circulation or lowering of the absorber temperature by refrigeration, the difficulty of separating and retaining the highly volatile propane, must still be met. Most gasoline-plant stabilizers are not built for high enough pressures to permit a thorough retention of propane.

In increasing the absorption of propane, it will be necessary to increase the oil circulation, to lower the temperature, to increase the pressure in the absorber, or to do a little of all three of these things. To absorb as much of the propane as the plant has heretofore been absorbing of butane, will require the following changes in the three variables just mentioned providing only one of the variables is changed in order to absorb the propane:

Oil circulation increased by 2 or 3 times.
Decrease oil temperature by 60°-80° F.
Increase pressure (abs.) by 3 to 5 fold.

Thus, it is obvious that changes in any single variable would be impractical; that all three changes may need to be made, such as to double the oil circulation, lower the temperature to say 55° F., and increase the pressure as much as possible, or be satisfied with only a partial absorption of the propane.

After having absorbed some propane it is then necessary to separate it as a pure liquid and keep it in the liquid state. The following tabulation of the vapor pressures (90° F.) of the hydrocarbons involved in the stabilizer and gas separators of the plant, will indicate the pressures that must be employed.

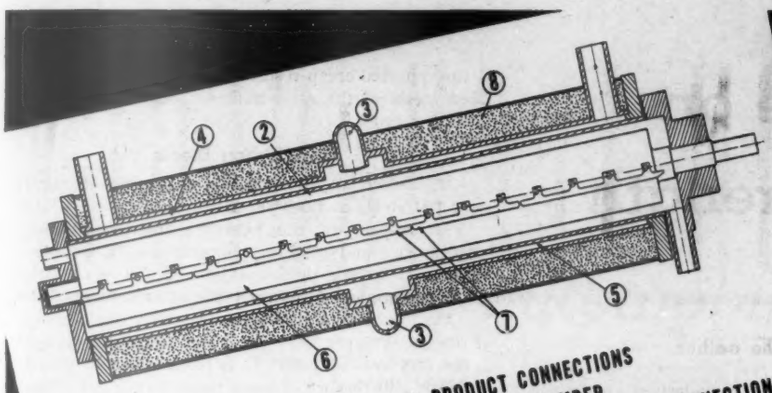
Material—	Vapor pressure (approx.) 90° F.	55° F.
Ethane	800 lb./sq. in.	450
Propane	160	95
i-Butane	60	35
n-Butane	45	25

Thus, a stabilizer that is to produce butane as a product near the top of the tower can be operated with a reflux of propane and a pressure of 150-200 lb. per sq. in. will suffice, but if propane is to be produced as a product near the top of the tower, ethane will be the main constituent of the reflux and the pressure increases to over 450 lb. per sq. in. A lowering of the reflux or gas-separator temperature by refrigeration will help but will not completely solve the difficulty. In some degree, the loss of propane at gas separators, etc., can be alleviated by recompression of these gases or by sending them back to the absorbers, but such operations are expensive.

Effect of Altitude on Gasoline Tests

Are the distillation curve or other properties of gasoline altered by testing at other altitudes than sea level?—A. W. S.

The effect of altitude is to lower the A.S.T.M. distillation range by about 1° F. per 10 mm. of barometer reading below 760 mm., or 1° F. per 375 ft. of elevation above sea level. The low-boiling materials require smaller than the average correction and vice versa. The Reid vapor pressure requires no correction because it is based on the increase in pressure within the bomb during the test. Corrections for A.S.T.M. octane numbers are cared for in the octane number test procedure. These matters are discussed in the A.S.T.M. publication Petroleum Products and Lubricants, and barometer readings for various altitudes are given in handbooks.



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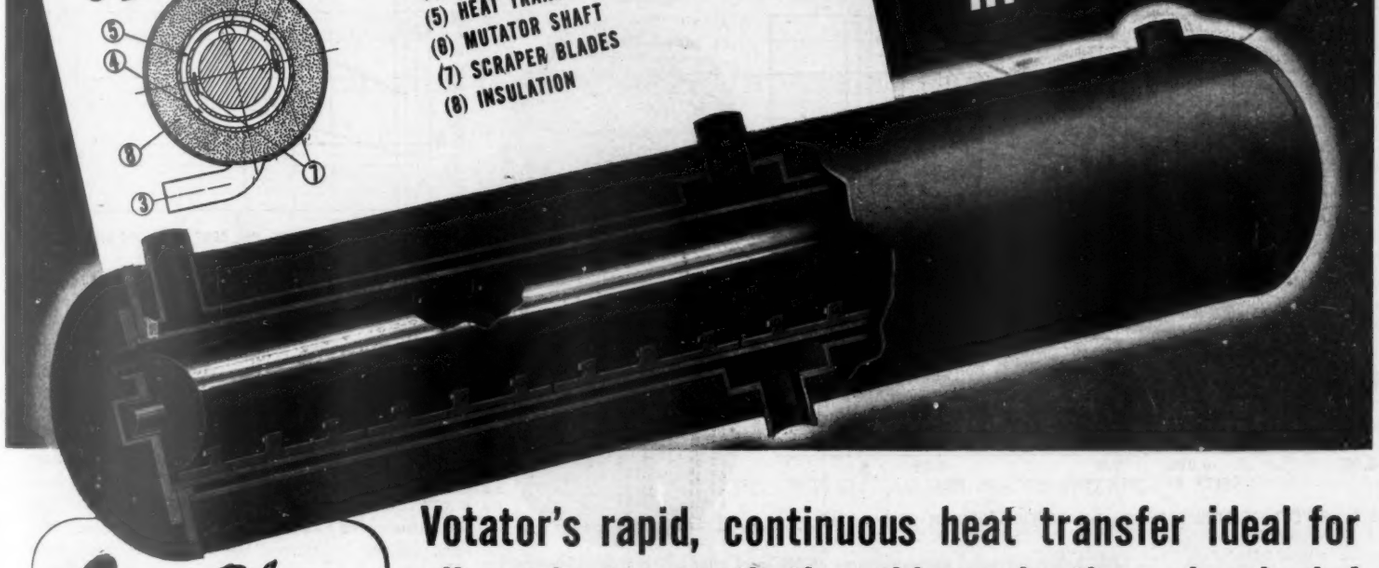

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Influence of Structure on High-Temperature Strength

By C. L. CLARK
Timken Roller Bearing Co.

PART 1—LOW ALLOYED STEELS

This is the ninth of a series of articles by the author

IT has long been recognized that marked differences in the microstructure of a given steel exert an influence on the resulting room temperature physical properties, as evidenced by the commercial use of water or oil quenching and annealing to impart certain desired characteristics. It is only recently, however, that the effect of slight differences in the microstructure on the high-temperature load-carrying ability has been realized. Many of the apparent discrepancies in the reported creep results of different laboratories on steels of the same analyses can be attributed to this cause.

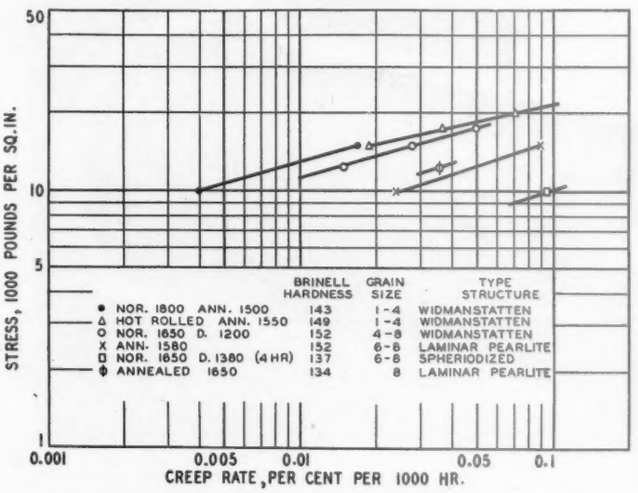
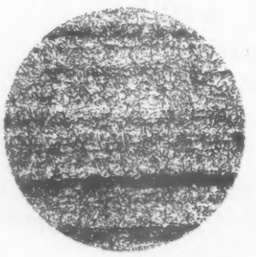


FIG. 1. EFFECT OF STRUCTURE ON THE CREEP STRENGTH OF DM STEEL AT 1000° F.



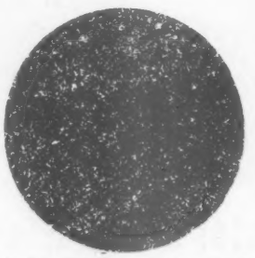
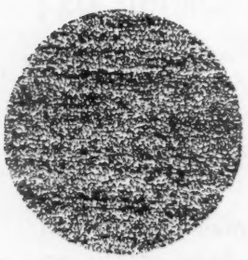
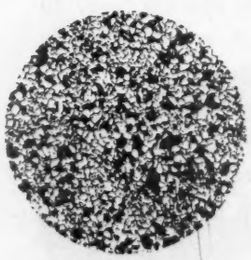
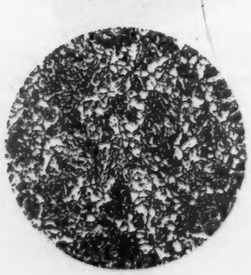


Fig. 2 (left): Typical microstructures of DM steel after different heat treatment. Top: (a) Annealed 1,650° F. Center: (b) Normalized 1,650° F., drawn 1,200° F. Bottom: (c) Normalized 1,800° F., annealed 1,500° F.

Fig. 6 (above): Microstructures of 17-22A steel after two different heat treatments. Top: Normalized 1,725° F., drawn 1,250° F. Brinell 315. Bottom: Oil quenched 1,650° F., drawn 1,275° F. Brinell 300.







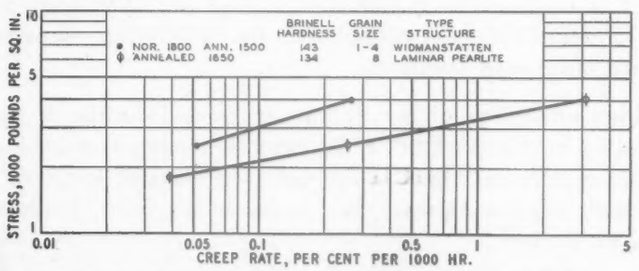


FIG. 3. EFFECT OF STRUCTURE ON THE CREEP STRENGTH OF DM STEEL AT 1200° F.

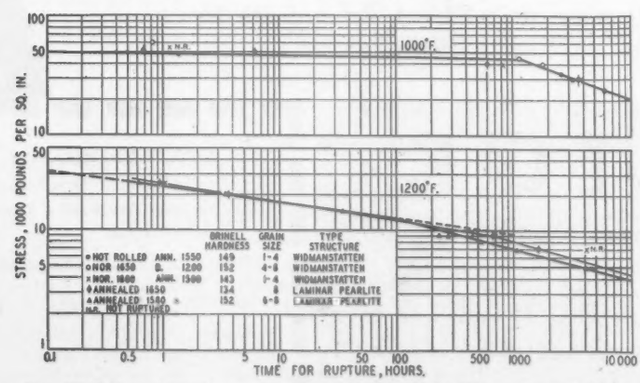


FIG. 4. INFLUENCE OF STRUCTURE ON THE RUPTURE STRENGTH OF DM STEEL AT 1000 AND 1200° F.

Low-Carbon Steels

The effect of structure on the creep strength of DM steels at 1,000° F. is shown in Fig. 1. Data with respect to the heat treatment, hardness, grain size and structural characteristics are also included in this figure, while Fig. 2 shows photomicrographs of different types of structure.

On the basis of the stress required for a creep rate of 0.10 per cent per 1,000 hours, the range for DM steel at 1,000° F. is from 10,000 to 21,500 lb., or a difference of more than 100 per cent. The highest creep strength was imparted by the three normalizing treatments, followed by either the 1,500° F. anneal or the 1,200° F. temper; while the lowest strength was possessed by the spheroidized structure. The strength of the two annealed structures is at about the mid-point of the total range.

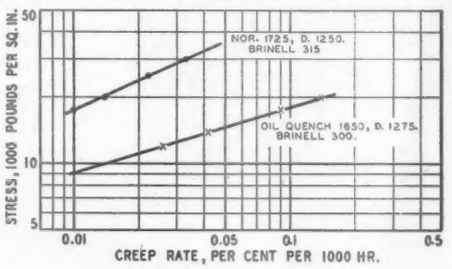


FIG. 5. STRESS - CREEP RATE CURVES AT 1000° F. FOR TIMKEN 17-22A STEEL.

If attempts are made to correlate the creep strength with the structure it is apparent that grain size is a factor, with the coarser-grained steels possessing the greater strength. That this is not the only controlling factor is apparent from the differences existing between the annealed and spheroidized structures, both of which were fine-grained; and also by the fact that normalizing from either 1,800° or 1,650° F. gave about the same strength even though the difference in grain size was pronounced.

The carbide structure is believed to be the controlling factor in so far as the creep strength is concerned, with the Widmanstatten type structure as shown in Fig. 2 (*b* and *c*) imparting the maximum creep resistance and the spheroidized structure the least. Grain size likewise has a bearing, with respect to the carbide formation, for the Widmanstatten type structure can only be produced by air-cooling a coarsened grain.

The effect of certain of these structures on the creep strength of DM steel at 1,200° F. is shown in Fig. 3. As at 1,000° F., the normalized 1,800° F., annealed 1,500° F. structure is superior to that annealed at 1,650° F. with the difference, based on the stress required for a creep rate of 0.10 per cent per 1,000 hours, being 900 lb. or about 45 per cent.

That structure also has an influence on the rupture strength of DM steel at 1,000° and 1,200° F. is evident from Fig. 4. These results are not as yet as complete as the creep findings, but it is apparent that variations in the type structure does not influence the rupture strength to as great a degree as the creep resistance. For a fracture time of 1,000 hours at 1,200° F. the maximum difference is of the order of 1,000 lb., or 15 per cent. Again, however, the differences which do exist are in favor of the coarse-grained Widmanstatten type structure.

Structure also has an influence on the creep strength of the higher-carbon steels as shown in Fig. 5, which sets forth the creep strength of

(Continued on Page 59)

The automobile on a diet

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Refinery IDEAS

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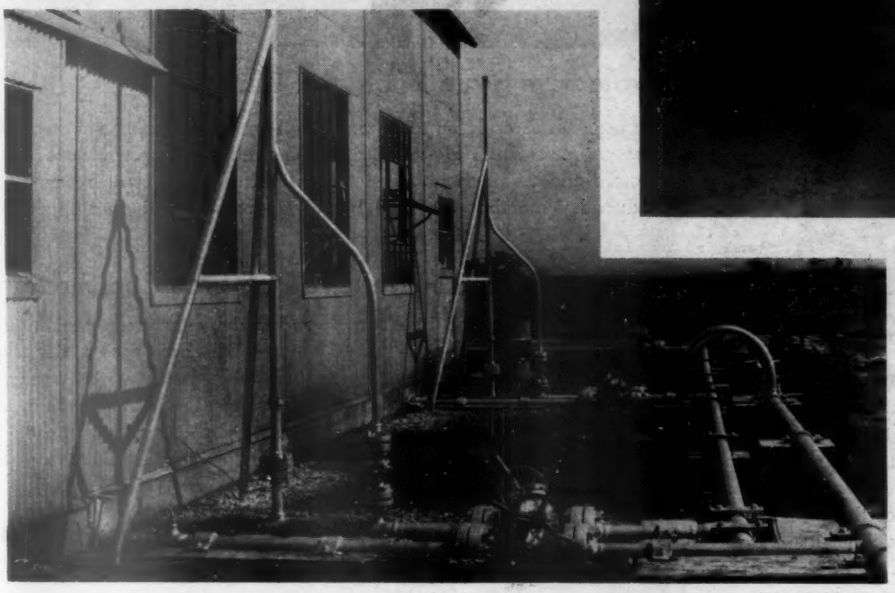
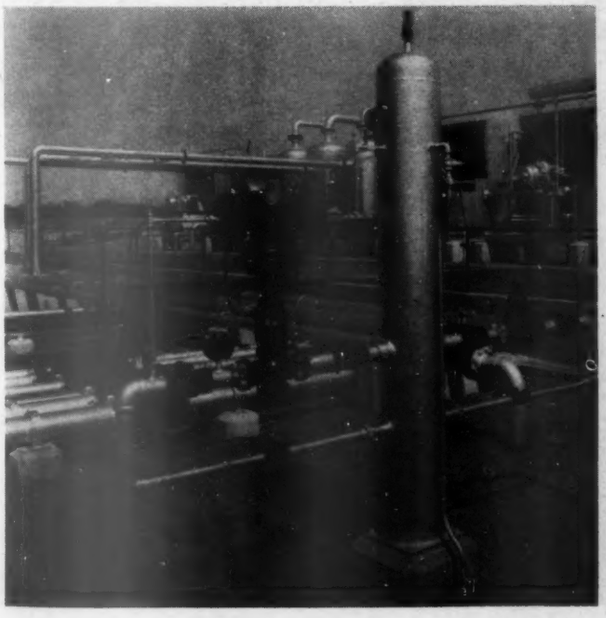


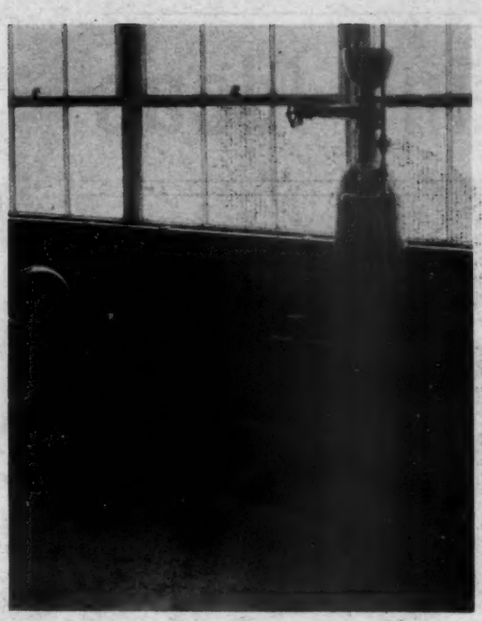
Extend Pressure-Relief Valve Well Above Ground Level

High-pressure gas lines, especially those which serve compressors in pressure-maintenance or repressuring operations, are often vented in short sections in order to permit repair of the compressor. The release of this gas can be made dangerous if it is done near the ground surface. Here the operator has extended the vent line upward about 12 ft. and has braced it in all directions. The safety line and the vent line containing the hand-operated valve have been combined.



Gas Scrubber Set in Line Supplying Fuel To Engines

To avoid solid materials being carried by entrainment to the gas engines, one company has installed a small scrubber in the supply line as shown in the photograph. A baffle arrangement inside the scrubber knocks out any dust. Liquids, including chemical treating agents can be sprayed into the scrubber if the need is present.

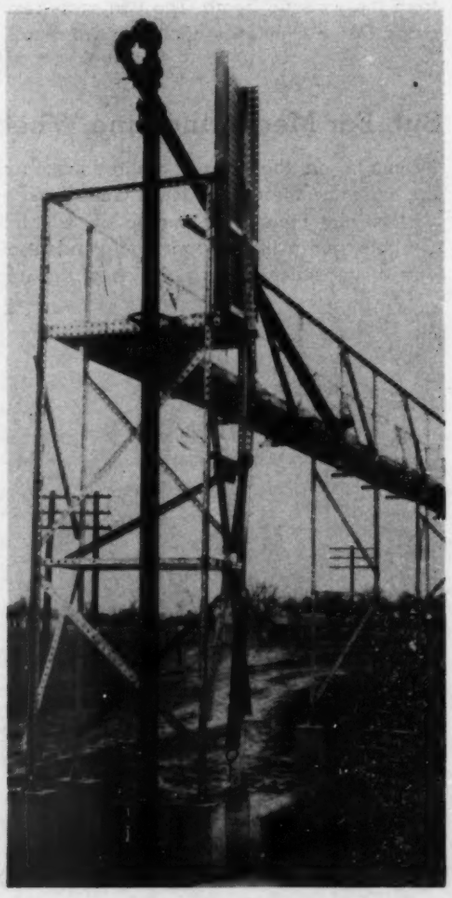


Storage for Lubricant

A steel cylinder, capable of withstanding more pressure than is needed to force the steam-cylinder lubricant to several engines but unfit for the transportation of commercial gases, serves as an ideal pressure storage tank for heavy machine oils. Here the old gas cylinder is shown equipped with a wide funnel on top to permit easy refilling, an air-inlet and valve near the top of the cylinder and a supply and drain line on the bottom.

Coil Spring Holds Platform In Vertical Position

The walkway on a loading rack is held in a vertical position by a coil spring when not in use. A lever extending past the bottom of the walkway and on its underside holds one end of a connecting wire that passes over a pulley guide.



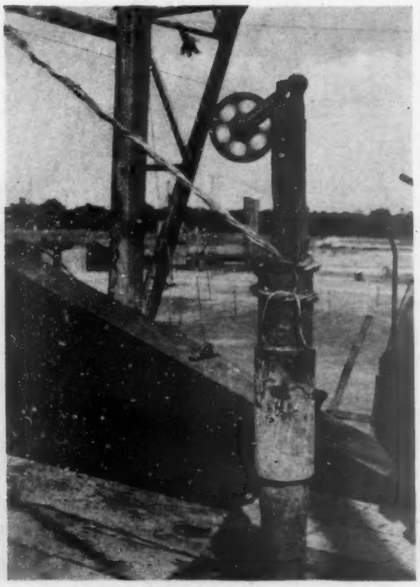
Operating Ideas

Stirrup For Two-Well Counterbalance

Whenever the second well on this two-well pumping unit installation is operated the counterweight must be taken off or the unit will be off balance. The weight is supported by two arms hung in a stirrup from the walking beam. It can be taken off easily by one man simply by lowering the back end of the walking beam enough that the weight rests on a seat on top of the power unit. This gives enough slack in the stirrup that it can be disengaged from the walking beam. The two arms rest on a roller support secured to the front legs of the unit and can move up and down.

Sub For Measuring Line Wheel

By cutting out the sides of a short section of old drill stem having the male-end threads intact, a Gulf Coast operator devised a support for the measuring-line pulley which insures centering over the hole, and a firm support independent of the traveling block or any of its attached parts. Holes at the upper corners of the two standing sections of the sub provide for a bolt which serves as direct support for the wheel hook, while the clearance afforded by the cut-away portions insures straight running of the line as the edges contact the yoke of the wheel frame. A few strands of seizing or raveled manila line, tied around the sub and then twisted a few times around the wire, serve to wipe it clean of mud as the indicating device is withdrawn from the drill stem.

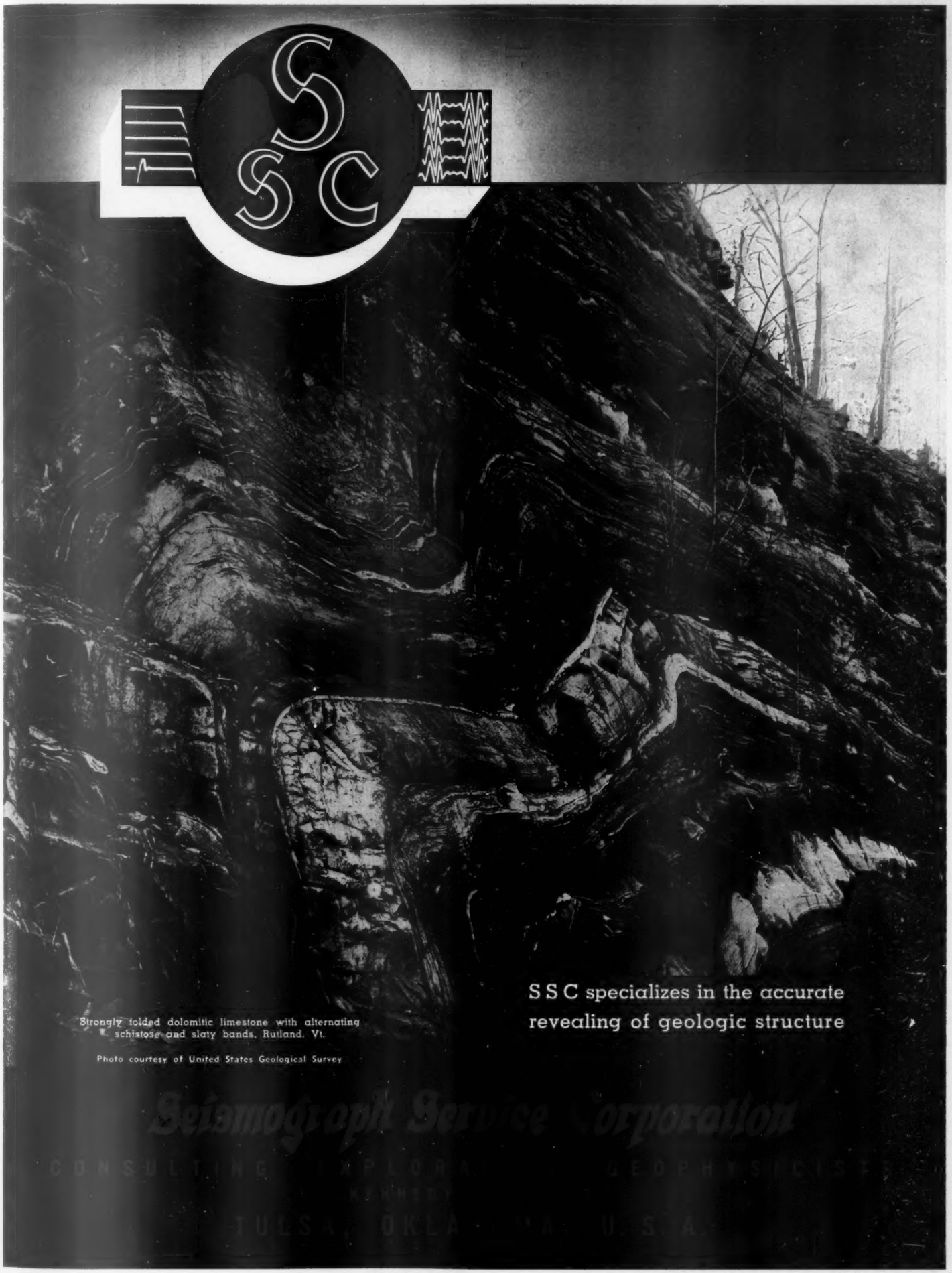


Protectors Save Tool-Joint Threads

Damage to threads on tool joints is prevented by using protectors put on pipe when shipped from the mill. By saving these protectors and using them for moving, thread trouble will be greatly reduced. Note that the core barrel is dressed and awaiting use.

Counterbalances Relieve Pull-Line-Rod Strain

Strain on the pull-rod line can be reduced by the proper counterbalancing of the pumping jack. Two methods, both essentially the same except for the difference in anchoring point of the control rods, which prevent swinging of the weight, and the amount of weight used, are shown. In one the control rods are anchored to the back leg of the jack and in the other they are attached to the front legs.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revealing of geologic structure
Strongly folded dolomitic limestone with alternating schistose and slaty bands, Rutland, Vt.
Photo courtesy of United States Geological Survey
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TYPICAL OIL-FIELD STRUCTURES

Complexly Faulted Dome

Eola Field, Avoyelles Parish, Louisiana

(Compiled by The Oil and Gas Journal)

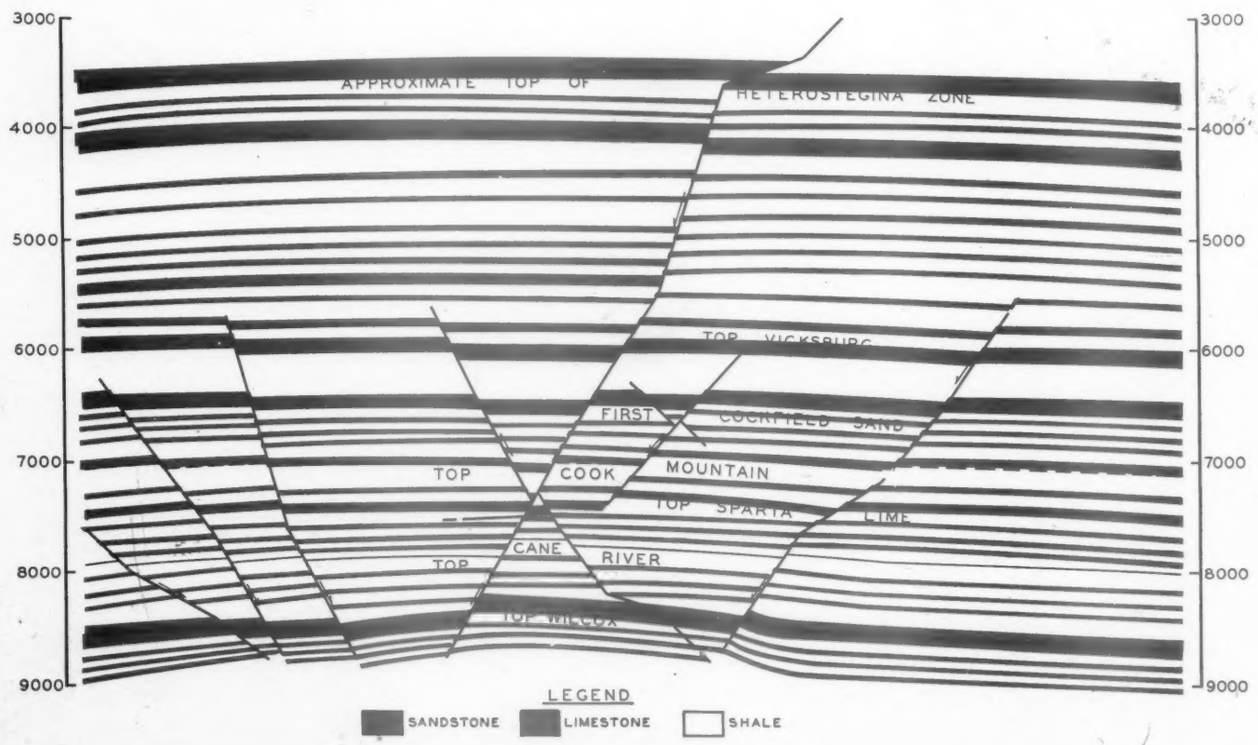
GENERAL GEOLOGY: The Eola oil field is one of a number of fields found along the Gulf Coastal Plain on trend lines associated with wedging sands but in which the occurrence lies at some distance from the old shore line. The known stratigraphy of the coastal plain begins with the Wilcox (Eocene) at the latitude of Eola, but the Midway or lowest Eocene is probably present lying above a thick series of Cretaceous and older sediments. These formations represent deposition along an old shore line in which there were originally two great embayments, known as the East Texas and Mississippi embayments situated on both sides of the Sabine uplift. As deposition continued, the shore line moved progressively outward and smoothed out so as to become more or less parallel with the present coast. The weight of the sediments depressed the outer edge of the coastal plain so that each formation thickens towards the Gulf. At the same time, some formations which are largely continental on outcrop grade laterally outward into a marine series.

The uniform seaward slope of the coastal plain deposits is interrupted by two types of structure, which may eventually turn out to be different phases of the same type. These are salt domes and faulted domes not definitely known to be associated with salt domes. The sale domes are of the piercement type in that they have punched their way through sedimentary strata which have been laid down over them.

One explanation for the origin of salt domes is that they do not move upward but remain stationary while the surrounding sediments sink on all sides. Salt is squeezed in from below and is added to the base of the dome and whenever more salt cannot be added in this way, the dome itself subsides with the remainder of the sediments. According to this theory, there may be domes stopping at any level from the present surface, or even above, down to a few feet above the original salt bed which is generally considered to be Jurassic in age. In such a subsiding area, the soft formations surrounding the domes would become compacted and the formations above the domes would themselves be arched with some closure on the north side. They would probably be complexly faulted. These conditions would be found to an even greater extent if the salt domes rose against a cover of clays and sands.

Another explanation of faulted domes is that they arose as a result of adjustments in a subsiding wedge and do not require localization by salt domes or similar resistant plugs.

STRUCTURE: The accompanying structure maps and cross-section show the complexity of the faulting at Eola. The outline of the field at the level of the Wilcox is that of a dome, roughly oval in shape, resting on a broad gentle regional nose on a seaward dipping monocline. Close correlation above the Vicksburg at about 5,700 ft. is difficult because of rapid variation in facies. Most of the faulting cannot, therefore, be traced above this level. As the fault planes rise through the geologic section, their displacement decreases considerably and by Cockfield time, the structure



West-east cross-section of Eola field

has lost its north closure and appears as a southeasterly plunging nose, except where some closure has been caused by faulting.

There are several noticeable unconformities in the section, of which one occurs above the Vicksburg and the other above the Wilcox.

OIL-BEARING HORIZONS: Although the Cockfield and Sparta sands carry oil where they rise above the water level, main production is from the Wilcox. Eola was the first important field to establish this formation as productive, opening up a wide belt for exploration to this level.

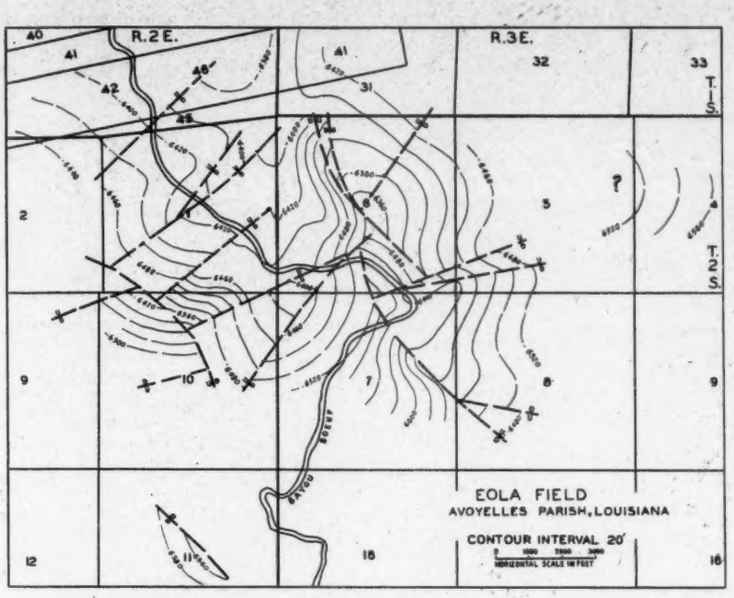
The different fault-block segments behave differently and there is a definite variation in bottom-hole pressures in the various segments. However, the constant water level in the Wilcox indicates that this lack of connection has not persisted through geological time. It is probable that connections were established along the faults which later became cemented.

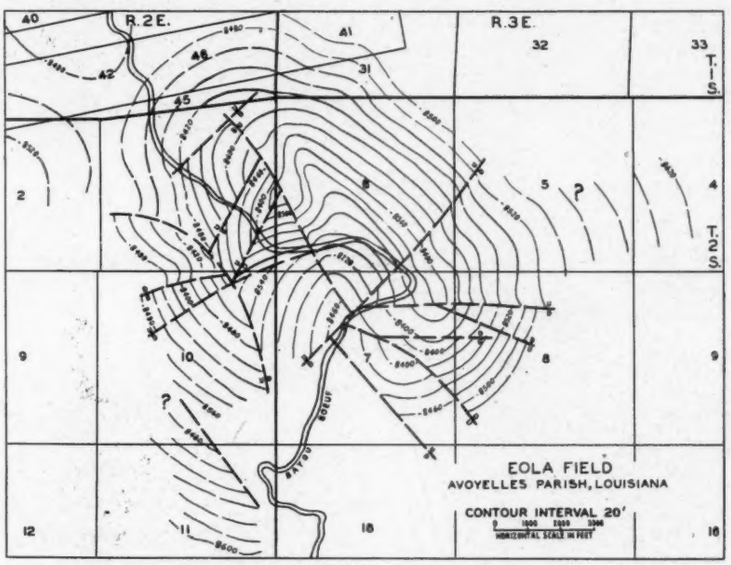
ORIGIN OF THE OIL: The Cockfield is a predominantly sandy combination of the different Claiborne facies and is plainly a near-shore or lagunal formation. It contains an abundance of carbonaceous material which may have formed the source of the oil. The small amounts of oil found in the Sparta sand may have had a similar origin as the formation is of the same type. The Wilcox is a black silty lignitic shale and is either of shallow marine or lagunal origin. All of the producing sands are thus near-shore deposits formed in environments which are considered most favorable for the accumulation of oil-forming materials. The unconformity at the top of the Wilcox might have permitted the introduction of additional material on submergence.

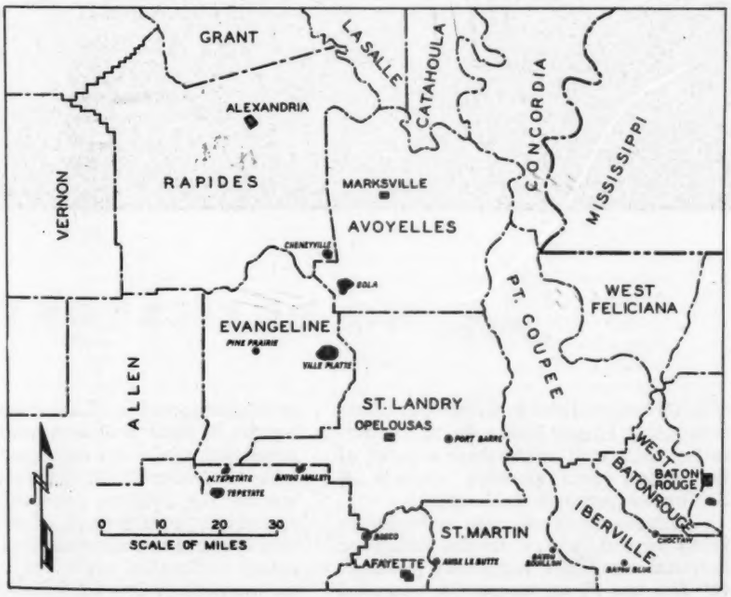
Extension of these near-shore facies along trends more or less parallel to the coast has resulted in a series of development and exploratory programs of considerable importance. Developments in Texas show that Wilcox production is not limited to the upper part of the formation but may occcur at any depth in it. As the Wilcox is locally several thousand feet thick, the possibility of picking up local shore-line trends is very great. The same is true of the upper pays, the Sparta and the Cockfield as well as in higher horizons such as the Vicksburg and various zones in the Miocene and Pliocene.

OTHER FIELDS OF THE SAME TYPE: Most of the fields of the Gulf Coast district in which the producing horizons do not flank salt domes are of this type. Faulted structures are found in other parts of the country but they are of a different nature, probably owing to the fact that other structural movements are involved and also that the formations involved contain limestones and are more highly indurated.

EXPLORATION METHODS: Surface and subsurface geology are of little value in locating these deep-seated complexly faulted domes since, as has been pointed out, the structures die out toward the surface and correlation of the upper formations is quite difficult. The reflection seismograph is responsible for the majority of the discoveries so far made. Regional geology and the extension of trend lines helps guide seismic prospecting. Micromagnetic measurements are sometimes used in prospecting for deep domes.







Right, above: Eola field, showing structure on top Cockfield sand. Center: Structure on top Wilcox sand. Bottom: Oilfield map of Eola area. Principal reference: Geology of Eola Oil Field, by Fred W. Bates, A.A.P.G. Bulletin, Vol. 25, No. 7

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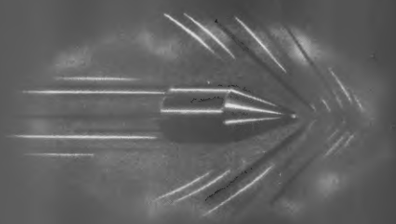

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A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

RIG OPERATION

MAY 21, 1942

ACCURATE DEVIATION TESTS REDUCE DRILLING COSTS

RECORDS accumulated from a large number of wells have shown conclusively that an average of 6 days' drilling time is lost each time a hole is allowed to deviate more than 3½° from the vertical. In all the wells studied to obtain this average, no plugback jobs were undertaken to straighten the holes. The time was lost simply by having to hold up on the pipe so that the course of the bit would return to the vertical. Most of this tremendous loss of time could have been avoided through the proper use of an accurate vertical-test instrument. Such an instrument would have made it possible to correct any drift away from the vertical before this drift could have reached serious proportions.

The loss of time resulting from a plugback and redrilling job is apparent to any one. But there is a more common straightening job which can, and often does, lose more drilling time than the plugback and redrilling job. This is the case in which the course of the hole is returned to vertical simply by taking most of the weight off of the bit while drilling is continued. Ordinarily, this practice is followed when the deviation limit is approached without being exceeded.

The accompanying illustration is a composite of a group of charts made for a large number of wells. By plotting the drilling-time data and the well-surveying data for each well side by side on the same sheet of coordinate paper, certain relations became apparent. Above all, these charts showed the great decrease in drilling progress that occurred each time the deviation limit was closely approached. They showed clearly that when a hole deviates as much as 3½° the course of the bit can only be brought back to vertical with great difficulty, and with a far greater loss of drilling time than would ordinarily be expected.

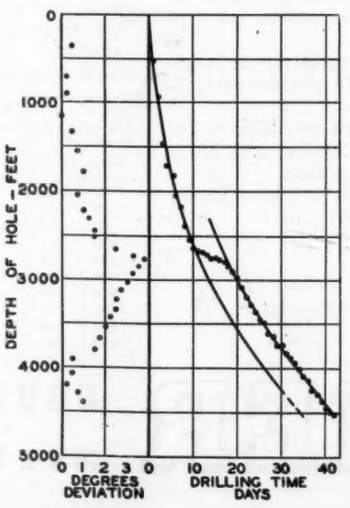
The following steps are recommended in order to guard against deviation of the hole to such an extent that return to vertical will be difficult:

1. Much of the difficulty due to crooked hole is brought about by making deviation tests too far off bottom. In the accompanying chart the test which showed a deviation of 2½° was taken when the bottom of the hole was actually 3¾° off vertical. Likewise, the test at 2,500 ft., showing 1½° deviation, was probably taken at a time when the bottom of the hole was well over 2° off; or in other words, at a time when corrective measures should have been taken. Thus, if tests are made too far off bottom, deviation will not be detected until it becomes excessive.

2. Tests should be made frequently, probably every 50 to 200 ft., depending on local conditions.

Necessity of Accuracy

3. Vertical-test instruments should be of unquestioned accuracy, so that slight changes in deviation will indicate to the driller whether more or less weight should be applied to the bit. The necessity for accuracy can be appreciated if the following example is considered: Suppose an instrument is known to be accurate only within ½°. A test shows a deviation of 1°; then 50 ft. deeper another test shows deviation of 1½°. Since either one of these tests may have been off ½°, and in opposite directions, the hole may actually be getting straighter, rather than more crooked. But on the other hand, the course of the hole may have changed from ½° off vertical to 2° off vertical within a depth of 50 ft. This example therefore should serve to show that without accuracy a well-survey instrument is entirely useless as a guide for adjusting drilling weight.



The essence of the above recommendations is that deviation tests should be taken as a guide in drilling rather than merely as a check to ascertain that the provisions of the contract have been fulfilled. Measures used for promoting straight holes are well known to all drillers, and include careful regulation of weight on the bit, concentration of weight at the bottom of the drill stem through the use of heavy drill collars, use of straight drill-pipe joints, and use of drill collars in which the fluid passages are accurately centered to prevent wobbling of the assembly.

In late years it has been proved that straight holes are quickest and cheapest to drill. In some cases where oil companies have insisted on a deviation limit of 2° it has ultimately resulted in decreased drilling time, since this limit does not permit the hole to get crooked enough so that excessive time will be consumed in bringing it back to vertical.

At the present time it requires a degree of economizing in order to operate a drilling rig at a cost of $300 per day. At this rate it follows that a cost of $1,800 is incurred whenever a bit gets off its course by 3½°, since it requires an average of 6 days' drilling time to get the bit back on course. The size of this sum indicates that almost any reasonable measures that will help to keep the bit on its vertical course are economically justifiable. It also suggests that a plugback job, or the use of an oriented whipstock, or the reaming of the hole, may all present cheaper methods of returning the bit to its course (even when the deviation limit has not been exceeded) than the practice of holding up on the pipe.

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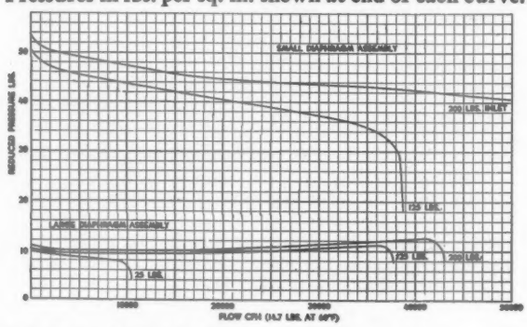
PROVIDES LARGER CAPACITY AND CLOSE REGULATION

CLOSE REGULATION . . Typical curves show extremely accurate pressure reduction. Type 630 — Size 1"—Orifice size ½"—Fluid 0.6 Gravity Gas. Inlet Pressures in lbs. per sq. in. shown at end of each curve.



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LARGE CAPACITY . . Compare this capacity with any other similar regulator. Type 630 — Fluid 0.6 Gravity Gas 60° F. and 14.7 lbs. per sq. in. absolute.

Pressures Lbs. per sq. in.		Capacity — Cubic Feet Per Hour							
		1" and 1¼" Body				1½" and 2" Body			
		Orifice Size				Orifice Size			
Inlet	Outlet	⅛"	¼"	⅜"	½"	⅛"	¼"	⅜"	½"
20	5	510	2040	4520	8290	560	2230	4930	9030
50	10	960	3850	8500	15600	1050	4200	9300	17000
75	15	1340	5340	11800	21600	1460	5830	12900	23600
100	20	1700	6800	15100	27600	1860	7450	16400	30100
150	30	2450	9800	21600	39600	2680	10700	23600	43200
200	50	3180	12700	28100	51500	3480	13900	30700	56200
250	75	3930	15700	34800	.. ..	4300	17200	37900	.....
400	100	6150	24600	54500	.....	6730	26900	59400	....
600	125	9130	36500	.. ..	....	9980	39900	.. ..	.....
1000	150	15080	60300	.....	.....	16480	65900	.....	.....

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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 16

MAY 21, 1942

CORRECTED GAS-COLUMN PRESSURE

IN some fields, the pressures and depths are so great that the deviation of gas from the law of perfect gases should be considered when calculating the pressure due to the weight of a column of gas in a well. This is particularly true if the gas contains an appreciable amount of the heavier hydrocarbons.

Rawlins and Schellhardt* have derived a formula for computing the pressure exerted by the gas column in a well where conditions are such as to necessitate the consideration if deviation from the law of perfect gases. This formula is

$$\frac{P_s}{1 + P_s b} = \frac{P_1}{1 + P_1 b} e^{GL/53.34T}$$

Where

P_s = pressure at bottom of well, lb. per sq. in. abs.
P_1 = pressure at well head, lb. per sq. in. abs.
b = a deviation coefficient, deviation per lb. per sq. in. of pressure.
G = specific gravity of gas (air = 1.00).
L = depth of well, ft.
T = average temperature of gas in the well, °F. abs. (°F. + 460).

In order to use this formula it will be necessary to have actual deviation data on the particular gas with which one is concerned or else use some method of calculating the deviation coefficient, b, from data similar to that given in Installment 11 or Installment 13 of this series. Table 1 of this installment gives values of the deviation coefficient, b, which have been calculated from values of the deviation factor, d, given in Table 2, Installment 11. The relation between b and d can be indicated by the following equation:

$$b = \frac{d - 1}{\Delta P}$$

where ΔP = amount in pounds per square inch that the pressure at which deviation is to be considered exceeds the pressure at which there is no deviation. (Since the pressure at which there is no deviation is arbitrarily taken as 14.7 in Table 2, Installment 11, ΔP would approximately equal the gage pressure at which deviation is to be considered.)

*E. L. Rawlins and M. S. Schellhardt, "Back-Pressure Data on Natural-Gas Wells and Their Application to Production Practices," U. S. Bureau of Mines, Monograph 7, 1936, Revised 1939, pp. 166-69.

Example

Problem.—Given the data of Example 2, Installment 15. Calculate the pressure due to the weight of the gas column and the bottom-hole pressure of the well at the midpoint of the gas sand considering deviation of the gas from the perfect gas law. Compare with the values obtained when deviation was neglected.

Data given in Installment 15 were:

Specific gravity of gas = 0.70.

Well-head pressure = 400 lb. per sq. in. gage.

Atmospheric pressure = 14.0 lb. per sq. in. abs.

Average temperature of gas column = 100° F.

Depth to midpoint of gas sand = 3,250 ft.

Solution.

$$GL = 0.70 \times 3{,}250 = 2{,}275$$

From Table 1, Installment 15,

$$e^{GL/53.34T} = 1.0791$$

The value of b, from Table 1 of this installment, corresponding to a specific gravity of 0.70 and a temperature of 100° F. is 0.00019. (It will be noticed in the table, that values of b vary slightly with pressure, but such variation is so slight that b may be considered the same at the pressure P_s as at the pressure P_1).

Substituting values in the formula already given,

$$\frac{P_s}{1 + P_s \times 0.00019} = \frac{414}{1 + 414 \times 0.00019} \times (1.0791) = 414.2$$

Then

$$P_s = 414.2\ (1 + 0.00019\ P_s) = 414.2 + 0.0787\ P_s$$

$$0.9213\ P_s = 414.2$$

$$+ 0.0787\ P_s\ 0.9213\ P_s = 414.2$$

P_s = 414.2/0.9213 = 449.6 lb. per sq. in. abs.

The pressure due to the weight of the gas column is

$P_s - P_1$ = 449.6 — 414.0 = 35.6 lb. per sq. in.

In Installment 15, $P_s - P_1$ was calculated to be 32.7 lb. per sq. in. This value then was 2.9 lb. per sq. in. too low due to failure to consider deviation from the law of perfect gases. Under the conditions of this problem, a consideration of deviation would not be necessary for most practical purposes.

TABLE 1—DEVIATION COEFFICIENTS "b" FOR NATURAL GAS
(Free of air and carbon dioxide)

		Gage pressure, lb. per sq. in.					
	°F.	300	400	500	600	700	800
Sp. gr. 0.60	60	.00016	.00016	.00016	.00016	.00017	.00017
	80	.00014	.00014	.00014	.00014	.00014	.00014
	100	.00011	.00012	.00012	.00012	.00012	.00012
	150	.00009	.00009	.00009	.00009	.00009	.00009
	200	.00006	.00006	.00006	.00006	.00006	.00006
Sp. gr. 0.70	60	.00023	.00025	.00026	.00026	.00027	.00027
	80	.00021	.00021	.00022	.00023	.00023	.00024
	100	.00018	.00019	.00019	.00020	.00020	.00020
	150	.00013	.00014	.00014	.00014	.00014	.00014
	200	.00010	.00010	.00010	.00010	.00010	.00010
Sp. gr. 0.80	60	.00033	.00035	.00037	.00038	.00039	.00040
	80	.00029	.00030	.00032	.00032	.00033	.00033
	100	.00025	.00027	.00028	.00028	.00028	.00028
	150	.00019	.00019	.00020	.00020	.00020	.00021
	200	.00014	.00014	.00015	.00015	.00015	.00015
Sp. gr. 0.90	60	.00044	.00047	.00050			
	80	.00038	.00040	.00042			
	100	.00032	.00032	.00033			
	150	.00022	.00023	.00022			
	200	.00016	.00017	.00017			
Sp. gr. 1.00	60	.00059	.00062	.00066			
	80	.00049	.00051	.00054			
	100	.00042	.00043	.00044			
	150	.00029	.00029	.00029			
	200	.00021	.00021	.00021			
Sp. gr. 1.20	60	.00097	.00102				
	80	.00081	.00085				
	100	.00070	.00074				
	150	.00047	.00049				
	200	.00035	.00038				

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

ALTHOUGH we have been and will continue for the duration to exert every effort toward winning the war, we also are striving to provide equipment and service to aid in the production of oil which is so vital in our drive to Victory.

Improved design and quality construction insure long life and trouble-free service for these, and other, BJ Oil Tools. — Ask us for the details you desire — your supply store can get what you need, promptly.

THESE NEW BJ TRIPLEX HOOKS PROVIDE INCREASED SAFETY AND CONVENIENCE . . *but they cost less!*

THE 60-TON SIZE is ideal for use with portable rigs; the 125-ton size is for wells of average depth; the 200-ton size can be used for all except extremely deep wells. Designated as the "60" - "125" - "200" - each number indicates the rated capacity in tons, with a safety factor of 4 based upon the ultimate strength of the hook.

Numerous improvements include: an oversize pin which passes through a hardened bushing in the shank and joins the hook assembly to the body; a DUPLEX Body (View 4) which is installed by merely removing and replacing the shank pin; a unique double bearing with a small bearing for effortless swivelling when spinning-in pipe, and a large bearing which assumes *all* of the drilling load; a new swivel lock which locks in 8 different positions to prevent rotation while drilling. *Look on pages 462 and 463 of the 1942 Composite Catalog for complete details, or send for the BJ 1942 Catalog.*

1. BJ "60" Triplex Hook with "Triplex" Body and standard single bail.

2. Illustrating method of direct connection to block.

3. All "locking arms" open. When closed, the links and swivel bail are securely enclosed.

4. Equipped with "Duplex" Body. The clevis is optional auxiliary equipment.

BYRON JACKSON CO.

Houston • LOS ANGELES • New York

Above: One slip removed to show simple design. Note massive "stirrup" latch.

Center: "Varco Bultons" or cross-wickered slips are available. On variable pipe diameters the flat-back slips uniformly contact body of spider.

Right: Lever lowered to retract slips when running-in casing; slips set when lever is released.

BJ CASING SPIDERS do 4 things well!

CREWS AND OWNERS are unanimous in their approval of this casing spider for 4 important reasons: (1) It grips instantly and positively without crushing the pipe; (2) It operates rapidly, easily and safely; (3) It is readily removed by opening the door; (4) It lasts a long time, with minimum replacements, repairs or adjustments.

The assembly is made of alloy steel, completely heat treated, with a strong hinge pin joining the two halves of the body in the rear, and a massive stirrup-type latch securing them in front. A single lever opens all four of the extra long slips which are balanced by "floating" on springs and move into gripping position automatically. Complete descriptions and illustrations are in the BJ 1942 General Catalog — sent free at your request — and on pages 485 to 487 of the 1942 Composite Catalog.

Journalog

A BIWEEKLY FEATURE OF THE OIL AND GAS JOURNAL

No. 6

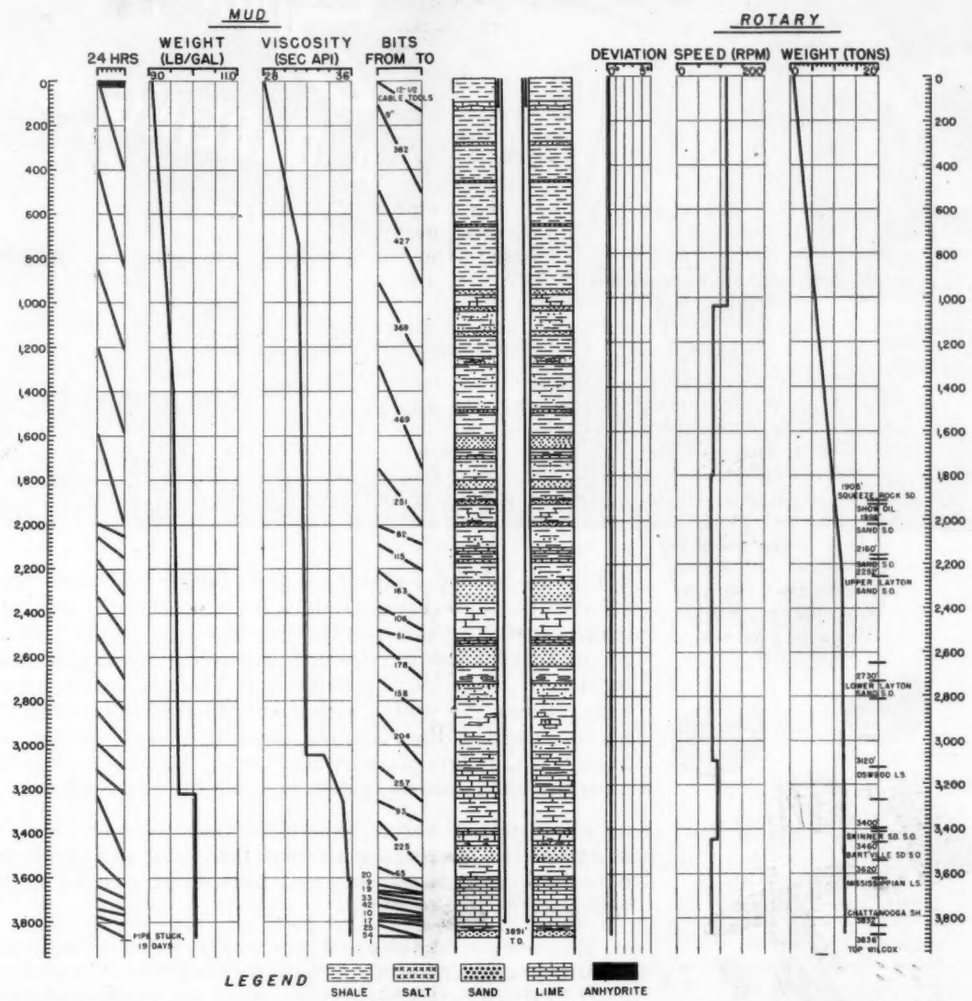
MAY 21, 1942

ALMA OIL CO. 1 DEROIN

SW NW NW 25-23n-3e

J. E. TRIGG
CONTRACTOR

Discovery Well, Unnamed Pool, Pawnee County, Oklahoma



DRILLING DATA

Date started	3-17-42
Rigging up rotary, days	2
Drilling started	3-18-42
Days drilling—Rotary	44 1/3
W.O.C. none (surface pipe set with spudder)	0
Logging (electric)	1/3
Coring and testing	1/3
Circulating	1/3
Trips	2
Fishing	19
Waiting on fuel and core barrel	2/3
Breaking down drill pipe and running casing	1
Shutdown weather (while fishing)	1
Net drilling time	21 2/3
Set 7-in. casing	5-1-42

MUD USED

Type—	Amount
Aquagel	470 sacks
Fibertex	82 bales

Top Wilcox	3,868 ft.
Gas to	3,880 ft.
Oil to	3,891 ft.

BITS USED

	No.	Size
Cable tools	1	12½-in.
Rock bits	27	9-in.

CASING AND TUBING RECORD

Size—	Weight	Depth	Cement
10¾-in.	40	104	125
7-in.	17	3,810	400

COMPLETION—CABLE TOOLS

Waiting on cement, days	3
Drilling plug, hours	12
Bailing, hours	24
Loading hole, hours	6

PRODUCTION TEST

May 11, 1942, 23½-hour gage, flowed through casing and 4-in. line

Oil, bbl.	2,528
Gas, cu. ft.	10,500,000
Pressure flowing, lb.	105
Pressure shut in, lb.	1,080
Gravity, deg. A.P.I. cor.	43
Ran electrical log	3,861 ft.
Elevation	925 ft.

CORES—None.

● That's one of the reasons it lasts longer and seals better. Because of its exclusive design, little pressure is needed to make a Darling Valve seat tightly. The discs simply roll into place, then the last quarter turn expands two wedges against the discs for the tightest possible seal. To open, the first quarter turn releases the wedge action and up come the discs. And because Darling discs are *fully revolving,* they never seat twice in exactly the same place—wear is even, the valve lasts longer, a perfect seal is maintained throughout life of the valve.

Thousands of valves are ruined every year because their design makes it necessary to force them shut and break them open. Others "freeze" shut and have to be opened by heat which warps parts.

Why not use the valve that for over 40 years has been setting records in a dozen industries for long life and low maintenance cost? In these days when replacements are harder and harder to get, it pays to buy for permanence—buy Darling.

Darling offers you a quality line of longer-lasting Gate Valves. They come in Fully Revolving Parallel Seat Double Disc, also in Taper Seat—Slotted and Solid Wedge types. In service pressures up to 3000 pounds, you can get Darling Gate Valves in Cast Iron, Bronze, Forged Steel, Cast Steel, and Corrosion Resistant Alloys. Darling also manufactures Compression Type Fire Hydrants, Check Valves, Motor and Cylinder Operated Valves, and many accessories.

TRADE MARK
DARLING VALVE & MANUFACTURING CO.
WILLIAMSPORT, PA.

Electrification of Pipe Lines Carrying Crude Products

By W. H. STUEVE
Oklahoma Gas & Electric Co.

WITHIN the last several years there has been a decided trend among the marketers of fuel oil, gasoline, and other oil products used by the public in considerable quantities, to make deliveries of such products to inland destinations by means of pipe lines. In terms of ultimate cost to the marketer of oil products, the pipe-line method will perform the same service for one-third to one-fourth the cost, as against shipment made by rail in tank cars, after all factors of fixed charges and operating expenses are considered.

Recent outstanding installations, which have claimed the public attention, are the products lines of Plantation Pipe Line Co. and Southeastern Pipe Line Co. The latter line originates at a sea-level port to be served by ocean-going tankers, and the former, the Plantation line, originates practically at a sea-level port, the location of a large refinery at Baton Rouge, La. Utility electric power is used almost exclusively for the operation of all the pumps, the only exception being where pump stations were installed in remote or isolated localities where electric power in sufficient quantities was not available. In some of the cases where electric power of sufficient capacity was lacking, power-line extensions were made over considerable distance to permit the use of electric motors.

These two pipe lines represent almost 1,700 miles of pipe, ranging in diameters from 12 in. down to the smallest of 4 in. for short lateral lines.

Thus both pipe lines represent a total installed capacity of 29,150 hp. of which 26,450 hp. is supplied by utility electric power lines and 2,700 hp. on the Southeastern line, or 9.25 per cent of the total for both lines, is supplied with oil engines. The location of the two stations operated with engines, of the Southeastern Pipe Line at Port St. Joe and Blountstown, is in a sparsely settled part of Florida near the Gulf Coast which made it impossible to secure sufficient electric capacity.

Equipment Installed in Southeastern Pipe Line Stations

The capacity of the 8-in. line originating in Port St. Joe, on the Gulf, is 28,000 bbl. per day, when pumping (60° F./60° Be.) gasoline with 1,000 lb. per sq. in. initial pressure, requiring 600 b.hp. through 50 miles to Blountstown. In the event the temperature of the gasoline is somewhat higher and of the order of 80° F., the capacity will increase to 32,500 bbl. per day with 1,000 lb. per sq. in. initial pressure, requiring 720 b.hp. The engine-driven pump station at Blountstown has only 40 miles of pipe line to pump through to Bainbridge, Ga., and therefore the initial pressures and brake horsepower required are 20 per cent lower than the originating station.

Certain amounts of gasoline will be withdrawn from the line at various stations from Bainbridge northward, so that the 600 hp. of electric motors in the remainder of pump stations to Atlanta will not be overloaded even though pumping gasoline of 80° F. temperature. The station at Marshallville is a booster to permit pumping full capacity from Americus to Macon, a distance of 64 miles.

The motors are self-ventilated induction motors operating at 3,550 r.p.m. and are direct-connected to four-stage centrifugal pumps. The over-all efficiency of the pump and motor, when operating at full capacity, is about 75 per cent, thereby indicating that 0.85 kw.-hr. of electric energy is required to pump 1 bbl. of (60° F./60° Be.) gasoline 100 miles.

Typical of those installed in the main pump stations is a 300-hp., 3,600-r.p.m., 2,260-volt induction motor. It is self-ventilated, the air passing into the motor through ducts at both ends and being discharged through the center portion of the motor base.

Equipment Installed in Plantation Pipe Line Stations

The capacity of the 12-in. section originating at the Standard refinery in Baton Rouge, with pump stations spaced about 65 miles apart and initial pressures of 900 to 950 lb. per sq. in., when pumping 60° F./60° B. gasoline, will closely approximate 60,000 bbl. per day. Each pump station along the 12-in. section, excluding the originating station, is equipped with two 600/900-hp. 3,575-r.p.m. explosionproof motors, each direct-connected to centrifugal pumps capable of stepping up the pressure 450 to 475 lb. per sq. in., or when operating in series the two pump units will build up the full station initial pressure of 900 lb. per sq. in. Since the design engineers contemplated increasing the pipe-line capacity at some later date by 50 per cent to make the total amount delivered about 90,000 bbl. per day, the electric-motor design engineers answered this problem with a unique development of the double-rated horsepower motor, 600/900 hp. for the 12-in. section and 450/600 hp. for the 10-in. section.

The efficiency of these induction motors at full load closely approximated 94.5 per cent and the power factor was 93.5 per cent. This type of motor is the largest self-contained motor built for explosionproof service, being air cooled and self-ventilated, requiring no special cooling auxiliaries. The motor is about the same dimensional size as a conventional 500-hp. motor of same speed perfected just a few years ago. This design was largely due to the use of increased active iron and copper and the newly discovered high-temperature Class B insulation, which permitted the use of the same frame size used in motors of lower horsepower rating.

The 600/900 hp., explosion-resisting induction motors installed on the Plantation pipe line are typical. Electric-actuated protective devices are used to indicate current, temperature and pressure changes.

Under present pumping conditions in the 12-in. section of the line, when 60,000 bbl. per day at 950 lb. per sq. in. are being delivered, the motors are fully loaded at 1,200 hp. or 600 hp. each. Later, when the capacity of the line is to be increased 50 per cent, to 90,000 bbl. per day, the 900-hp. rating of each motor will be used, and then the motor design calls for special fans to be attached to the rotors of each motor to supply increased ventilation. The centrifugal pumps are of such design that the present impellers can be removed and impellers of the same diameters but larger capacity can be readily installed without affecting the original mechanical efficiency of the pumps. In this event intermediate pump stations will have to be inserted at halfway points between the present pump stations, or parallel loops for 70 per cent of the distance between stations of the same diameter pipe will be installed to eliminate the intermediate stations.

Each station contains special automatic-electric-control equipment, so that the operator can start or stop any motor, switch motors and control the gate and bypass valves from an operating room by push button. These highly efficient explosion-proof motors require special starting voltage of not less than 92 per cent of the full load running voltage.

When pumping at the rate of 60,000 bbl. per day, the velocity of the flowing liquid is 5 ft. per second, which velocity will be increased to 7½ ft. per second, when and if the intermediate booster stations are installed.

The 10-in. section of the line from Bremen, Ga., to Greensboro, N. C., with stations spaced at present an average of 50 miles apart and the 450-hp. rating motors in use can deliver about 48,000 bbl. per day of 60° F./60° Be. gasoline with an average of 900 lb. per sq. in. initial pressure at each station.

If this pipe line later is extended with 10-in. line to Norfolk, Va., from Greensboro, N. C., a distance of 210 miles, it would be possible to deliver ultimately 72,000 bbl. per day to tidewater, after the intermediate stations or loops are installed.

●

Influence of Structure on High-Temperature Strength

(Continued from Page 44)

17-22A steel at 1,000° F. after two different heat treatments. The microstructures corresponding to these two treatments are given in Fig. 6.

The range in the stresses, for a creep rate of 0.01 per cent per 1,000 hours, is from 9,000 to 17,500 lb., or a difference of nearly 100 per cent. The normalizing treatment yielded the higher value and from Fig. 6 it is seen that the air-cooling treatment produced a coarser grain size than did oil quenching. The carbide structure is also different, that of the oil-quenched specimen being highly dispersed while that after air cooling was acicular.

From the results presented, it is apparent that the microstructure does have a marked influence on the creep strength of the low-alloyed steels and a somewhat smaller influence on the rupture strength. The two main controlling factors appear to be grain size and carbide formation and of these two the latter is of the greater importance. For maximum creep resistance, at temperatures of 1,000° F. and higher, a coarse structural grain size accompanied by a Widmanstatten, or acicular, type structure is necessary.

Pipe-Line Activity

OPC Designates Nine Pipe-Line Projects

For the purpose of promoting the planning of new pipe-line facilities as well as more effective use of existing equipment which might serve to relieve the East Coast shortage, R. K. Davies, deputy petroleum coordinator for war, has designated nine projects with which temporary joint pipe-line subcommittees are concerned.

These are discussed elsewhere in this issue. Because of the difficulties confronting those who are trying to solve the pipe-line problems connected with supplying the East Coast, a number of important points are still undecided and certain projects apparently are being considered as alternatives.

Texas Pipe Line Contemplates Enlarging Tulsa-Dallas Line

Texas Pipe Line Co. is preparing specifications for a project, according to reports, which will fill in the gaps between the loops on the company's line between West Tulsa, Okla., and Dallas, Tex. This will result in furnishing two lines which can be operated separately for taking care of refinery requirements.

Most of the work on this program will be done between Stuart, Okla., and Dallas, Tex., and it will involve laying of about 118 miles which will probably be 8 and 10-in. pipe dug up from lines which are now in the ground in Texas. It is believed that a contract will be let which will cover the taking up of old pipe in Texas as well as laying pipe to fill in between the loops. As soon as a government permit is issued, it is expected that bids will be asked and the contract will be awarded in order that the work may start as soon as possible.

At the present the prevailing movement through Oklahoma trunk lines is northward. Five years ago between 75,000 and 80,000 bbl. daily went from Oklahoma to Texas. Probably the only southward trunk-line movement at present is that of Gulf Refining Co. from Tillman and Jackson counties of Oklahoma to Burkburnett, Tex., through a system which can only be effectively operated in that direction. Shipments are going from Texas north into Oklahoma through the Texas Pipe Line at the rate of about 16,000 bbl. daily, and through the Gulf Refining Co.'s system at the rate of about 15,000 bbl. daily.

Tapco Applies Again to WPB for Priorities

Trans-American Pipeline Corp. announced that it has again asked WPB for the priorities and allocations for steel necessary to construct a 12¾-in. pipe line from East Texas to Savannah, Ga., and Charleston, S. C.

Vincent G. Shinkle, consulting engineer for Tapco, presented with the request data and figures comparing the Tapco line costs and potentialities with those of the so-called "National Defense" line, a 24-in. line.

Mr. Shinkle represented, among other things, that with one-fifth of the steel required for the 24-in. line, Tapco can deliver nearly one-third as much oil as the larger line; construction cost of the Tapco line would be but 38 per cent of that of the 24-in. line; the Tapco line would not have its terminal in a congested target area, such as New York and Philadelphia. The Tapco line would be constructed in about 9 months.

The Tapco line, along with others, has been designated by Joseph B. Eastman, director of the Office of Defense Transportation, for study by R. W. Shields, pipe-line engineer for the ICC.

Surveying Will Start Soon For El Dorado-Helena Line

As soon as the weather clears aerial surveying will commence for the 150-mile 10-in. refined-products line from El Dorado, Ark., to Helena, Ark. It is expected that the route will be flown in 1 day and that 4 to 5 days will be required to complete the work of making photographic maps. Contract for surveying the line has been awarded to Aero Exploration Co. The line represents the principal construction required for a system arranged for moving refined products from the Gulf Coast by existing lines to El Dorado, Ark., and through the new line which will be made of old pipe to Helena, Ark. Further details regarding this project will be found in discussion of the nine pipe-line projects studied by OPC which appears elsewhere in this issue. Affairs of the project are being handled by Gulf Oil Corp., Houston pipe-line division.

Gulf Waits for Tank Cars To Move Oil From Racks

Up to the first of this week, Gulf Refining Co. had been unable to utilize the loading racks completed in recent weeks at Centralia, Ill., and Dublin, Ind., because of the scarcity of tank cars. The loading rack at Dublin can serve between 50 and 60 cars daily.

Crude Deliveries Through Eastern Lines Increase

Deliveries of crude oil through pipe lines in the East attained a new high in April, reflecting in part the increased movement to Atlantic seaboard states in lieu of tanker shortages.

For last month, the nine lines formerly in the old Standard Oil group, moved a total of 28.5 million barrels, an increase of 6 per cent compared with the previous month, but 53 per cent higher than in April 1941.

The first 4 months deliveries of these lines, too, were at a new record of 105.4 million barrels against 76.8 million in the similar period of 1941.

All lines shared in the augmented movement of crude.

In the accompanying tabulation is shown deliveries for April and for the first 4 months of this year, with comparisons for similar periods in 1941, in thousands of barrels:

	April		Four months	
	1942	1941	1942	1941
Buckeye	10,404	7,181	36,091	26,939
Eureka	971	885	3,750	3,032
Illinois	8,229	5,289	31,718	20,862
Indiana	2,702	2,082	9,900	7,664
National Transit	1,725	1,603	6,626	5,995
N. Y. Transit	1,026	642	4,056	2,978
Northern	1,485	831	5,581	3,703
Southern	797	448	2,911	1,469
S. W. Penna.	1,243	1,135	4,824	4,171
Total	28.582	18,645	105,457	76,813
Daily average	953	621	879	640

Congress Holds Hearing on Florida Canal and Pipe Line

Chairman Mansfield (D., Tex.) of the House rivers and harbors announced he would open hearings early this week on a bill (HR 6999) to authorize the appropriation of $144,000,000 for construction of a barge canal and pipe line across Florida to relieve the oil shortage on the East Coast.

The measure also would provide for deepening the existing 9-ft. barge canal from the west coast of Florida to Corpus Christi, Tex., to 12 ft. and extending the waterway on southward at a 12-

Pipe Line Personalities . . . . . Burt E. Hull

BURT E. HULL, president of Texas Pipe Line Co., Texas-New Mexico Pipe Line Co., Texas-Empire Pipe Line Co. and Kaw Pipe Line Co., has been connected with Texaco interests for 37 years during which time he has seen the firm's pipe-line operations expand from those of a small organization to the present extensive systems of Texas Pipe Line Co. and partner companies.

During his career Mr. Hull has had wide experience with oil fields of the Southwest and Mexico. In 1901 when the Spindletop field, Texas, was opened he was working for the Houston Post; one of his duties was to collect cash in advance in Beaumont, Tex., for advertising space bought by a large number of promoters. Later in the year he entered Texas A. & M. College from which he was graduated in 1904 with a degree of bachelor of science in engineering.

After graduation he gained practical experience on the Southern Pacific Railroad. At the beginning of 1905 he began his long service with Texas Co. interests when he was engaged in the construction of a 6-in. pipe line from Humble to Sour Lake, Tex. In November of the following year he was sent to Tulsa to begin engineering work on the pipe line from Oklahoma to the Gulf Coast.

In 1908 Mr. Hull was transferred to the refining department and was stationed at Port Arthur, Tex. In 1911, he became chief engineer of the refining department and was located at the Houston, Tex., headquarters. In July 1922, after 11 years as chief engineer of the refining department, he was elected vice president and general manager of the Texas Co. of Mexico and was located at Tampico, Mexico, headquarters. In 1925 he returned to Houston to become vice president of Texas Pipe Line Co., and he has since been continuously with this organization. For a number of years he has been president of the company as well as of the other three major pipe-line companies which Texas Co. interests operate in partnership with other companies.

Mr. Hull is a native Texan, born in Grimes County. He and his wife reside in Houston; they have one son, Lt. Burton E. Hull, Jr., who is on active duty with the U. S. Air Corps, and a daughter, Ruth, who lives in San Antonio, Tex.

ft. depth to Brownsville, Tex., on the Mexican border.

Because of the urgency of the situation regarding the transportation of petroleum products to the East from the Texas and Gulf Coast oil fields, said Mr. Mansfield, he was calling the hearings without following the usual procedure of waiting for views on the proposal to be submitted by the various interested governmental agencies. Army engineers will be among others called to testify at the hearing.

Construction of the canal across Florida would connect the existing barge route along the Gulf Coast with that extending northward along the Atlantic from Florida to New Jersey.

Pipe-Line Committee Duties Are Outlined by Coordinator

Designation of temporary joint pipe-line subcommittees has been announced by R. K. Davies, deputy petroleum coordinator, in a statement explaining the purpose and plan of the program which emphasizes the following points:

The diversion for war and other essential purposes of a part of the American tanker fleet normally employed in transporting petroleum and petroleum products to the Atlantic seaboard area, and the loss through war action of other vessels of that fleet, has resulted in a shortage of transportation facilities to move the quantities of petroleum and petroleum products required to meet military, industrial, and essential civilian requirements. It is essential to the successful prosecution of the war that expansion of alternative transportation facilities, including pipe lines, for the movement of petroleum and petroleum products to this area be undertaken immediately in order to alleviate this shortage to the greatest possible extent.

The temporary joint pipe-line managing subcommittee shall prepare plans for submission to the chief counsel of the Office of Petroleum Coordinator for War for the construction, financing, and operation of the pipe-line projects. Plans may provide for:

1. The joint construction, ownership, and operation of such pipe lines.

2. The sale, exchange, loan, or pooling of petroleum or petroleum products wherever and whatever extent may be necessary to operate such pipe lines at maximum capacity.

3. The use of pipe-line, transport, barge, terminal, and storage facilities without regard to individual ownership thereof wherever necessary for the most efficient operation of any pipe-line project approved in accordance with the terms of this recommendation.

The temporary joint pipe-line engineering subcommittee shall report to the director of transportation of the Office of Petroleum Coordinator for War the findings and recommendations of engineering studies and investigations.

In carrying out the duties, responsibilities, and functions, the temporary joint pipe-line managing subcommittee and the temporary joint pipe-line engineering subcommittee shall consult and maintain liaison with each other and with the other committees and subcommittees in Districts 1, 2 and 3 to the extent that plans or activities hereunder may affect such other committees. The temporary joint pipe-line managing subcommittee and the temporary joint pipe-line engineering subcommittee shall maintain such staff and appoint such persons as they find necessary to carry out their duties, responsibilities, and functions under this recommendation. The chairman of the general committees for Districts 1, 2, and 3, or the said subcommittees, may propose from time to time to the petroleum coordinator for war or to the deputy petroleum coordinator changes in the membership of the said subcommittees and may submit nominations for new members.

Natural-Gasoline Producers Warned Parade Is Passing

(Continued from Page 28)

I regret that I am not, at this time, able to delineate the position the natural-gasoline industry will occupy in the manufacture of synthetic rubber. The synthesis of the butanes to isobutylene and butadiene and of propane to styrene is well known and it seems quite reasonable to suppose that to the extent the manufacture of rubber from the C_3 and C_4 hydrocarbons is superimposed on the requirements for 100-octane gasoline will the demand for those fractions from natural gasoline and cycling plants be felt.

You probably noted that for the month of April the coordinator in recommending rates of crude-oil production for the several states adopted the principle of recognizing the output of natural gasoline and condensate. This simply carries on the practice previously followed by the Bureau of Mines in their monthly estimates of crude-oil requirements. Due to the very acute shortage of transportation with which you are all familiar, it has become necessary to work out a plan of operation for refiners in District 3, particularly those on the Gulf Coast, wherein refinery crude-oil runs and products to be manufactured are balanced against the transportation facilities available. Obviously, natural gasoline and especially that which is made incident to the production of allowable crude oil must be considered in any determination of allowable products manufacture and transportation facilities allocated for the movement thereof. This was not done in setting up the program for the month of May, but since the transportation, be it tank cars, pipe lines, or whatnot, now in use for these products is a part of the total transportation facilities considered available in the several districts from which will be drawn such tank cars as are determined to be more necessary in other districts, steps have been taken to correct this unbalance in future monthly schedules.

Industry Has Performed Admirably

Not only have you read and heard considerable about the acute shortage of transportation, you have seen the net effect of it in your markets. Unlimited credit goes to the several transportation committes and the Transportation Division of the coordinator's office for their work and you may be certain that out of it will come the most that can be expected of a very serious and complicated situation. For those of you who do not know I can say, with no fear of contradiction, that never before in our history has the cash register been shoved so far behind the welfare of our country. This is no time for flag waving but I can at least take my hat off to the executives of the petroleum industry who have answered the challenge of dwindling supplies of petroleum in District 1 by the utilization of tank cars and any other means of transportation at hand. The net financial loss to their companies already represents a colossal sum.

Great credit is due the railroads. To have maintained their properties, through the years of lean business, in such a state of preparedness as enabled them to rise to the occasion as they have in hauling vastly increased tonnage of all commodities is an example in managerial statesmanship. Last week they transported a daily average of 640,000 bbl. of petroleum products to District 1. There are in the neighborhood of 45,000 tank cars now in this service and their expeditious handling sets an all-time high in railroad operation.

I know most of you have gone as far as you think you can in speeding up the movement of your tank cars and releasing surplus cars for other service. Perhaps all of you have, but you are going to be called upon for more efficiency and more sacrifice. The military requirements for all petroleum products and gasoline for essential civilian needs must be met and transportation is our only disability. Civilian needs are so closely tied in with war work that it is difficult, if not impossible, to draw a definite line of demarcation. We cannot visualize winning a modern mechanized war with the civilian population on foot. The limitation order prohibiting the use of tank cars on hauls of less than 100 miles was just announced as I left Washington. Provision has been made for granting of exceptions in absolutely necessary cases, but your patriotism will guide you in making every effort to comply with this order so that you may release for other more necessary service every single car you possibly can.

Transportation Changes

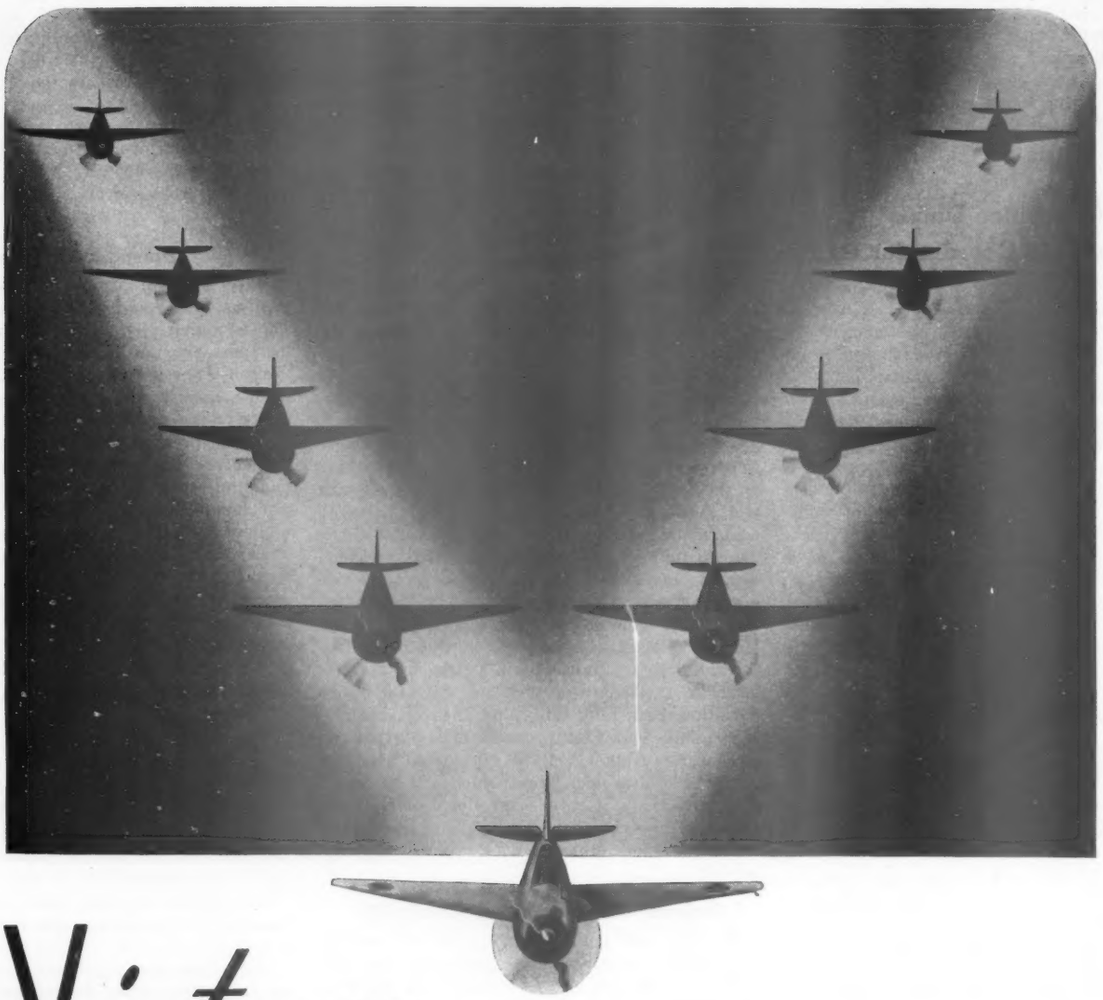
Since it has to do with transportation, I might mention here a fact well known to most of you. The admixing of natural gasoline with crude oil increases pipe-line capacity through reduction of viscosity. The net effect in this direction depends upon a number of factors, including original viscosity of the crude, size of pipe line, line design, operating pressure and atmospheric temperature. In general, it may be stated that any pipe line handling straight crude oil at its rated capacity can handle up to 15 per cent of natural gasoline without reduction on the crude-oil throughput. In other words, the natural gasoline rides to market free of any transportation charges. A sizable volume of natural gasoline is currently being transported by this method but especially during this serious shortage of tank cars it behooves the industry to explore all the possibilities of this method of transportation to the end that even more tank cars may be released.

In closing I want to refer back to the utilization of your product. I do not know but it is possible that no additional installations for the manufacture of 100-octane gasoline will be authorized, at least in the near future. That parade may have gone by but the line is forming for synthetic rubber and toluene.

The coordinator stated before the American Gas Association at its annual meeting in New Orleans May 6:

"At my request, representatives of the natural-gas and natural-gasoline industries have completed recently an illuminating survey of possibilities for the manufacture of the components of 100-octane gasoline, toluene, and synthetic rubber. An ample supply of these essential war products may prove to be the margin that will mean victory more quickly for the United Nations. Steps will be taken to assure the full utilization of the resources of these industries making these products in the production of these vital war materials."

There is much to be done. Through habit acquired in times of plenty under the exigencies of market demand the section of the petroleum industry which contributes the very acme of conservation lends itself to a practice so wasteful as to be shocking in wartimes. Using Bureau of Mines statistics as a base a conservative calculation indicates that during 1941 approximately 8,000,000 bbl. of butanes were wasted, after extraction and ready for market, at natural-gasoline plants in reducing the vapor pressure of natural gasoline to requirements of sales specifications. This amount of butane, given plants to convert it, represents a tremendous amount of synthetic rubber and any number of other critical war products. Rather a tragic paradox to contemplate in the light of our declining oil reserves, the critical materials that must be taken from ships, tanks, etc., in order to drill wells to discover and develop new reserves and the trend toward processing selected crudes of quite limited reserves. Something simply must be done about that. These excesses are going to catch up with us.



Victory

Victory in the present world war is not a matter of wishful thinking, "business as usual" and half hearted defense efforts. Nothing less than the last ounce of financial, industrial and moral support will justify the sacrifice and devotion of our armed forces. The personnel, the facilities and the resources of this bank are pledged to that end, whether it be in financing the government or the customers of this bank whose businesses are important to the war effort.

NATIONAL BANK OF TULSA

The Oil Bank of America

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

REFINERY ACTIVITY AND EXPANSION

Difficult Salvage Job Performed on Atlantic's Oil Tanker, E. H. Blum

PHILADELPHIA, Pa.—One of the world's largest tankers, the Atlantic Refining Co.'s E. H. Blum, which was wrecked east of the Virginia capes the night of February 16 by five explosions, has been salvaged and as soon as her two sections can be welded together and her machinery reconditioned, she will be put to sea again to carry oil for the United Nations.

This announcement was made here last week by Robert H. Colley, president of Atlantic.

The salvage job which retrieved the big vessel was carried out despite the judgment of experts who had visited the wreck and doomed it to be destroyed so as to remove the menace to navigation. The engineers who saved the ship battled with stormy seas which repeatedly undid in a few minutes laborious work which had taken days to carry out and finally, remained on the job continuously for 96 hours before they saw the second section of the vessel in a safe berth in Norfolk, Va.

After the wreck salvage experts visited the site. They found the big tanker almost broken in two sections, the break being just aft of the deck house. The forward section was unharmed. The 300-ft. section aft, containing the propulsion machinery, was resting on the bottom in 32 ft. of water. The engine room was flooded. Both sections were pounded by high seas. The salvage experts cut through the deck plates holding the two sections together, and towed the unharmed fore end to port. They recommended complete abandonment of the stern, with its propulsion machinery.

L. M. Goldsmith, chief engineer of the Atlantic Refining Co., was unwilling to accept this verdict, and received the cooperation of the Navy in making a survey of the underwater damage with divers. With the information so gained, Mr. Goldsmith recommended that an attempt be made to salvage the stern of the vessel. Experts of the Navy agreed that salvage was possible, and granted Atlantic permission to make the attempt, promising complete cooperation.

Salavge equipment and a crew were assembled, the Navy supplying that which Atlantic was unable to obtain. Most of the equipment was rushed by truck convoy from New York. Then started the most difficult part of the job, making the stern buoyant enough to float. By this time, a series of storms had caused the stern to settle in a shifting sand, so that the keel was buried 20 ft. in the sand, or a total of 52 ft. below the surface of the water. First, the holes had to be located, and then plugged with temporary patches. The most serious problem was weather which caused such severe seas that work could proceed only 1 or 2 days per week. Time after time the salvage crew returned to the wreck, after a storm, to find their work undone, their equipment lost overboard, and had to start anew. It was disheartening but with typical American spirit they refused to quit, and finally succeeded because they would not accept defeat. The holes were plugged, the pumps and compressors started, and slowly but surely, the ship rose from what was nearly her grave.

The two sections will undergo repairs and will be joined, to give the Merchant Marine another tanker, which will join her sister ships in the nation's service. Mr. Goldsmith is convinced that the salvage job could not have been successful if the ship had not been completely welded, a type of construction pioneered by Atlantic. He is also convinced that without the splendid help of the Navy and the support of the Maritime Commission the success of the project would not have been possible.

●

Acrylonitrile Placed Under Allocation Control by WPB

WASHINGTON, D. C.—To insure continued full production of Buna-n type oil-resistant synthetic rubber, acrylonitrile (vinyl cyanide) last week was placed under complete allocation control by the Director of Industry Operations.

The order, M-153, prohibits the delivery or use of acrylonitrile in any amount except upon specific authorization of the Director of Industry Operations.

The production of Buna-n type synthetic rubber is the sole use for acrylonitrile, and it is manufactured by only three companies. Synthetic rubber has been under complete allocation since July 1, 1941, so the Chemicals Branch of WPB knows exactly how much acrylonitrile is produced, and how much is needed.

Supplies of this material are adequate, according to present figures. Allocation of the supply is considered necessary at this time, however, to prevent dislocation of supply and demand because of excessive forward buying, or the accumulation of excessive inventories.

For the period between the present and June 1, 1942, applications for supplies of acrylonitrile should be made with respect to requirements for that period. Thereafter, applications should be made for each monthly period, prior to the first of each month. Provision is made in the order for allotment of additional amounts during the month to cover emergency requirements.

All Remaining I. G. Patents Placed Under Federal Control

WASHINGTON, D. C.—The alien property custodian has taken control of the last remaining patents or patent applications of the German dye trust, I. G. Farbenindustrie.

In previous orders, the custodian had taken control, in the name of the United States, of the German concern's gasoline, synthetic rubber, and other patents, and also had assumed control of affiliated companies holding other patents useful in the war effort.

A new order took over 500 patent applications for processes to manufacture various types of alcohol, fuel, medicines, and other chemicals. Other orders had covered several thousand other patents.

Oil Heating Restricted

OTTAWA, Ont.—The federal oil controller has ordered some 600 owners of oil-heating plants to convert to other fuel by July 31. The order affects commercial, industrial and municipal heating plants and similar large users, but does not include private residences.

Sketches of Plant Operators . . .

DAVID D. STARK, superintendent of the Watson, Calif., refinery of Tide Water Associated Oil Co., was born in Denver, Colo., April 6, 1893, where he subsequently acquired his primary and high school education. He completed his collegiate work in 1917 with a degree in chemical engineering from Carnegie Institute of Technology at Pittsburgh, Pa. Upon graduation, he was employed by the British War Mission in its Pittsburgh laboratory testing oils and explosives. Early in 1918 he was sent to Texas to supervise the testing and shipping of all lubricating oil from Port Arthur and Galveston.

After the armistice, Mr. Stark joined the Petroleum Section of the U. S. Bureau of Mines in Pittsburgh. While with the bureau he helped develop several of the test methods which are now universally used for petroleum products. He resigned from the bureau in 1923 to join the research and development department of Associated Oil Co. at the company's Avon, Calif., refinery. Many of his studies while in this department resulted in the processes now being used by the company.

In 1928 he aided in the design of the treating plants and the operations of the Watson refinery. In 1930 his company desired to build a refinery near Yokohama, Japan, to process its crudes for local distribution. Mr. Stark was appointed superintendent and took charge of the designing of all equipment which was done at Avon, and then he was sent to Japan in 1931 to watch the finishing of construction and the starting of operations. He remained in Japan for a 3-year period, returning to California in 1934 to take over the superintendency of the lube-oil and asphalt plant at Avon refinery. He was transferred as superintendent of the Watson refinery in 1936.

Mr. Stark is active in all phases of the petroleum industry in Los Angeles Basin. He is married and has two boys, one in high school and the other finishing college. His hobbies include golfing, fishing and other sports.

WHO'S WHO IN REFINING

Standard Oil Co. of Ohio

FOUR refineries with combined crude-oil capacity of 77,500 bbl. daily are operated by Standard Oil Co. (Ohio) and its Kentucky subsidiary, Latonia Oil Corp. Last week, the company completed arrangements for sale of $15,000,000 in 20-year, 3 per cent sinking fund debentures out of which $7,000,000 will be applied to construction of additional refining facilities and to capital funds required by changing conditions.

Standard of Ohio's products are chiefly consumed in the eastern part of the Middle West, centering in Ohio where three of the company's refineries are located. The company is fully integrated engaging in producing, crude purchasing and transportation operations along with refining and marketing. Crude-oil purchasing operations of the company are conducted by Sohio Corp., a subsidiary, which is the largest buyer in the Illinois and Indiana producing district. Decline of production in the states nearest Standard of Ohio's refineries has caused an expansion of the territory from which crude is drawn. Recently, the company completed arrangements for purchasing crude in the Midway field of Arkansas and in other southern districts.

Standard of Ohio is among the nation's refiners participating in the 100-octane gasoline program and in other phases of the manufacture of war materials from petroleum. Recently, the company completed construction of a catalytic alkylation unit and has launched a catalytic cracking project tying in with the general program for increasing production of the more essential war materials from petroleum hydrocarbons. Earlier, the company installed catalytic polymerization units at all of its refineries after proving the value of an original unit at the Toledo plant.

A summary of the company's refinery operations is given below:

Location—	Crude-oil capacity (bbl. daily)	Cracked gasoline (bbl. daily)
Cleveland, Ohio	28,000	*9,700
Lima, Ohio	10,500	*4,000
Toledo, Ohio	25,000	*7,200
Covington, Ky.	14,000	5,300
Total	77,500	26,200

*Raw-charge capacity.

Sohio Pipe Line Co., another wholly owned subsidiary, carries on transportation operations in the integrated unit. Decline of production in Illinois has had no appreciable affect on pipeline operations because most of the facilities are arranged to pick up crude from the Mid-Continent and Texas areas through connections with other carriers. Location of the company's refineries at Cleveland and Toledo will enable Standard of Ohio to participate in the increase movement of petroleum through the Great Lakes, other inland waterways and product pipe lines fingering through the East Coast states.

A few months ago, the company completed and occupied a new research and development laboratory at Cleveland, Ohio, where the chief work will be aimed at improvement of motor-fuel and lubricating-oil quality.

Refinery operations of Standard of Ohio are under direction of G. W. Hanneken, vice president. H. F. West is chief engineer in charge of construction and E. B. McConnell is chief process engineer.

C. H. Metz, Jr., is superintendent and I. L. Peterson, assistant, at the No. 1 works, Cleveland refinery. The No. 2 works at Cleveland is under supervision of L. B. Helm and R. H. Laird, assistant.

D. F. J. Sanders is superintendent and W. K. Bergen, assistant, at the Toledo plant and the same respective positions at Lima are held by J. R. Cuthbert and M. G. Ball.

A. H. Buchanan is superintendent at the Covington, Ky., plant of Latonia Refining Corp., and S. R. Bolles is assistant.

The Latonia company recently acquired additional land adjoining the Covington plant but details of the projected use have not been announced.

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Continental Will Build Two War-Material Plants

WASHINGTON, D. C.—Construction of two war-material units at Ponca City, Okla., by Continental Oil Co. for production of aviation gasoline and toluene was announced here last week.

Continental, acting as agent for Defense Plants Corp., will arrange for construction of the new units. The company then will lease and operate the plants under government control.

The two plants will cost several million dollars but information available here left this detail, along with those related to capacity and completion date undisclosed because of censorship regulations.

Ban Kerosene Use

OTTAWA, Ont.—Use of kerosene in noncommercial marine engines has been prohibited by Oil Controller G. R. Cottrelle. The order does not affect the use of kerosene by Canadian or Allied armed forces.

A "Buyer's Guide" for STEAM TRAP Users

FEATURES Operating Engineers want in Steam Traps:	THE ARMSTRONG STEAM TRAP:
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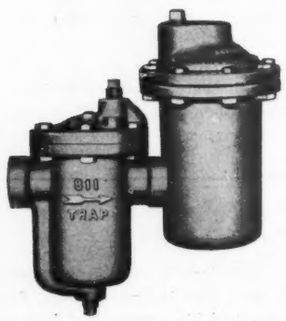
5. No steam loss for any load condition.	YES
6. Ability to hold tight against vacuum.	YES
7. Freedom from friction and wear.	YES
8. Small size — light weight.	YES
9. Simple construction.	YES
10. Large capacity.	YES



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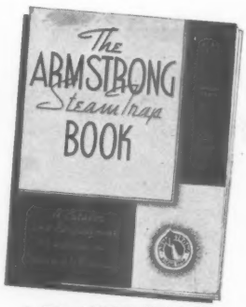

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Above—Century 15 horsepower splashproof motor.

At left — Century SCT splashproof motor driving an oil well pumping unit.

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You'll find Century Type SCT Splashproof Pumping Unit Motors in the major oil fields of the world—for the entire industry has long recognized the advantages of this motor particularly engineered for oil field pumping.

Century Motors' world-wide acceptance is the result of a close study of the specialized needs of the oil industry. Splashproof design to withstand out-of-door operation in various climates during all seasons, and torque characteristics to start tough loads and cushion load shocks as well, have made Century Type SCT Motors particularly adaptable to oil field use.

The cushioning action of these Century Motors means less wear and tear on equipment, impacts on vital parts are materially reduced, pumping units last longer.

Other extra value advantages of Century Type SCT Motors for oil field pumping include greater starting efficiency, greater starting torque with less starting current, smoother power demand, and smaller variation in line voltage. Splashproof construction assures continuous operation by providing protection against rain, snow, sleet, and ice.

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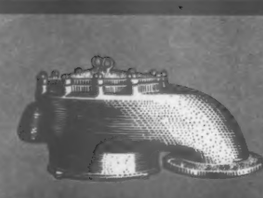
VACUUM VALVE

AUTOMATIC GAUGE

PRESSURE TYPE GAUGE COVER

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions reported last week dropped again below the 300 level, being down 57 from the previous week. Producers were off 32, gas wells 7 and dry holes 18. Comparing the average of recent weeks with last year's activity, it can be seen that oil wells are down more than 50 per cent while gas wells and dry holes have not declined to nearly the same extent.

If times were normal, 1942 would probably be experiencing a drilling boom. It is not many years since the Ellenburger was considered of relatively little importance. It had been penetrated at several localities in West Central Texas without much success. In West Texas, Big Lake had prolific production from the Ellenburger but this was considered more or less of a freak occurrence.

Simpson production was unknown in Texas and the equivalents of the Viola and Hunton of Oklahoma were not known to be potential producers. In southern Oklahoma, the Ordovician pays were known but structures were steep and offsetting even good producers was hazardous. The change in interest in the Ordovician has been gradual but under conditions which have existed in the oil industry during the past decade the cumulative effect of the numerous discoveries would normally have resulted this year in as intense activity as has yet been seen in the southern Mid-Continent.

Apache and Cumberland in Oklahoma started development along a series of trends parallel to the Arbuckle and Wichita folding which now extends from Cooke and Montague counties in Texas to the southern Panhandle. In the North Texas area, Ellenburger production is of major importance in K.M.A. and has been proved over a large area around this field as a nucleus.

In West Texas, interest in the Ordovician shifted from Big Lake into Crane and Pecos counties with Sand Hills, Apco and Abell but discoveries at Barnhart and later in Andrews and Ward counties have extended the Ordovician play over an area about 60 miles wide from east to west and 50 miles long from north to south. Combining the areas occupied by all of these discoveries, we find a southwest-northeast belt 500 miles long and 125 miles wide in which Ordovician production is found at so many points that it is a potential producer on structure throughout the whole area. This area is 50 per cent larger than that occupied by Permian production in the West Texas-New Mexico area and it is not inconceivable that it will contain reserves in proportion. Moreover, the Permian petroliferous province overlaps known Ordovician production far to the north and west and this area has not been tested even on structure to determine the potentialities of the deep pays.

MICHIGAN: One of the two producers reported is a 500-bbl. well opening a new pool in Osceola County (p. 77).

WEST CENTRAL TEXAS: Caddo lime production is indicated in Callahan County in the Baird-Pueblo shallow area (p. 80).

WEST TEXAS: The approaching expiration of leases in southwest Andrews County compelled drilling which has resulted in recent discoveries in the Permian and Ellenburger limes. To the north, the Fullerton area has its fourth producer. Shell's Ward County Ellenburger discovery is greatly improved on acidization (p. 74).

OKLAHOMA: Another small area in St. Louis has proved productive in the second Wilcox. Tecumseh, a one-well pool in the Simpson, may become a fair-sized Hunton pool as a result of recent completions (p. 83).

LOUISIANA GULF COAST: The Jug Lake prospect in Terrebonne Parish is being tested in two sands reported as showing oil. After water broke in and killed the deep oil pay at West Gueydan the well was plugged back and yielded gas distillate. A deep test on the south flank of Bayou Sale indicates the possibility that that field may be linked with Horseshoe Bayou (p. 76).

NORTH TEXAS: Montague County occupies the limelight with a Simpson sand discovery and possible new production from the Viola and Marble Falls limes. Sewell, Young County, has a 3-mile extension (p. 80).

TEXAS GULF COAST: Fayette County in the updip sector of the Wilcox trend may have its first production. Shows are reported at intervals in over 1,000 ft. Stowell, Jefferson County, and Mayo, Jackson County, have been extended (p. 82).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended May 16, 1942)

	Oil	Gas	Dry	Total	Footage	Tll. comp. to date 1942	Tll. comp. to date 1941
N. Y., Pa., and W. Va.	47	10	5	62	115,831	1,425	1,919
Ohio	6	14	3	23	50,610	372	553
Indiana	1	0	2	3	6,747	135	164
Kentucky	1	2	2	5	12,270	149	234
Illinois	11	0	6	17	47,870	622	1,159
Michigan	2	2	8	12	27,720	259	321
Kansas	13	2	10	25	76,694	573	676
Nebraska	0	0	1	1	1,323	18	31
Missouri, Iowa	0	0	0	0	0	9	6
Oklahoma	13	1	9	23	73,022	512	535
Texas:							
North Central Texas	6	1	5	12	49,892	508	986
West Texas	19	0	2	21	111,056	669	730
Texas Panhandle	6	0	0	6	17,953	189	187
East Texas	2	0	1	3	13,857	170	436
Texas Gulf Coast	13	0	3	16	113,352	342	402
Southwest Texas	9	0	9	18	88,472	549	673
Total Texas	55	1	20	76	394,582	2,427	3,414
North Louisiana	1	0	1	2	10,160	209	213
Louisiana Gulf Coast	5	0	3	8	75,467	227	304
Total Louisiana	6	0	4	10	85,627	436	517
Arkansas	0	0	3	3	9,828	58	58
Mississippi and Southeast	0	0	0	0	0	37	91
Montana	7	0	0	7	17,236	62	85
Wyoming	1	0	0	1	690	38	51
Colorado, Utah	0	0	0	0	0	4	14
New Mexico	2	0	2	4	13,930	109	105
California	8	0	9	17	64,872	314	385
Total United States	173	32	84	289	998,852	7,559	10,318
Total previous week	205	39	102	346			
Week ended May 17, 1941	421	34	103	558			

OHIO: A new gas area has been opened in the east side of the Clinton area (p. 86).

WYOMING: Development of the shallow Circle Ridge dome continues. With the pay nearly 1½ miles above sea level, this is probably the highest field in the United States, if not in the world (p. 79).

ILLINOIS: A new McClosky area has been opened west of Mayberry, Wayne County. The discovery is flowing at the rate of 1,700 bbl. and is the largest producing wildcat of the year (p. 77).

CANADA: Prospects for extending Turner Valley both to the north and south look favorable. An east extension of ¼ mile is probable (p. 85).

CALIFORNIA: The heavy-oil discovery in the Antelope Plains section of Kern County gaged nearly 1,000 bbl. on test and appears to be a major discovery (p. 72).

EAST TEXAS: After Magnolia's offset to the discovery at Concord, Anderson County, was reported running high on the Austin, the section thickened and the Woodbine was low and dry (p. 80).

SOUTHWEST TEXAS: A new producing area or a 1½-mile south extension of the Rincon field is reported (p. 78).

MONTANA: Exploration for a south extension of the Cut Bank wedge edge continues (p. 79).

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Results at South Caesar Will Influence Carrizo-Wilcox Play

By F. L. SINGLETON

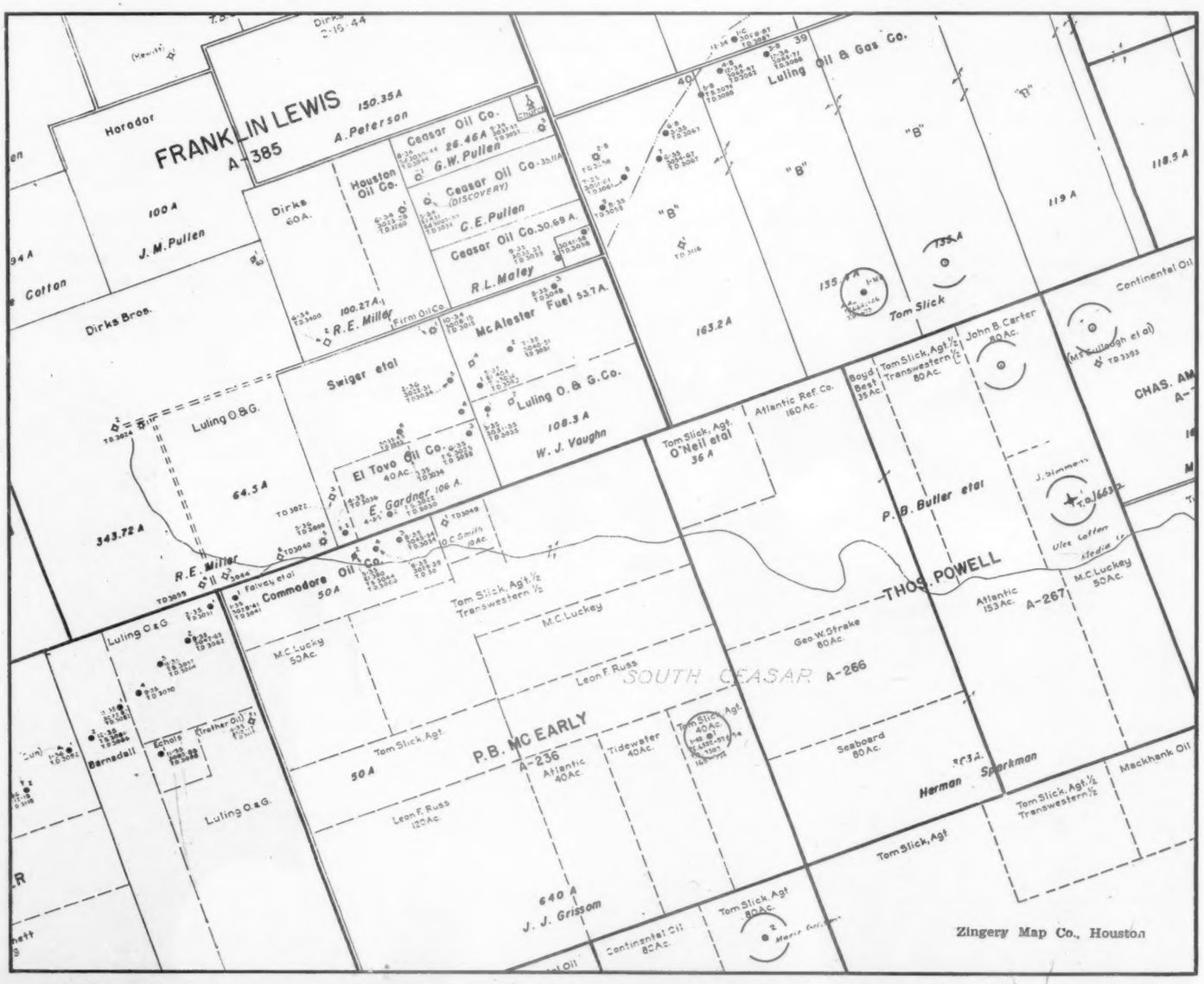
THE recent discovery of Carrizo sand production just south of the old Caesar field, Bee County, is regarded as the most significant development in the Southwest Texas district in several months. It is the first commercial Carrizo production to be found in the district and its discovery has thrown new light on the Carrizo-Wilcox trend which is being reflected by a broad leasing and geophysical program extending along the old Pettus sector of the Jackson trend.

The field is located 1 mile south of the Caesar field centering in the P. B. McEarly Survey. While development thus far has been limited to three wells, sufficient evidence has been revealed to mark the discovery as an important reserve. Subsequent development has opened production from a second sand, both of which have a thickness of about 50 ft., and production now extends over a mile in a northeast-southwest direction along an elongated structure which has been traced to parallel the Caesar field fault.

Production was opened in the area in February with the completion of Tom Slick, Jr., 1 J. J. Grissom. The well was drilled to a total depth of 7,505 ft., and was completed by perforating casing opposite sand at 6,552-57 ft. On an initial gage the well flowed 127 bbl. of 42-gravity oil daily through a ⅛-in. choke. Tubing pressure was 1,900 lb., and casing pressure 2,200 lb. The sand was topped at —6,099 ft., and the base of the section was logged at —6,151 ft., making a total of 52 ft. of sand.

Located approximately 5,000 ft. northeast of the above well, Luling Oil & Gas Co. recently opened production from a new sand approximately 105 ft. deeper with the completion of 1 Slick. The sand was topped at 6,610 ft., and the section was cored to a total depth of 6,657 ft. Completion was made by perforating casing at 6,642-46 ft. The "Slick" (6,500-ft.) sand was topped at —6,128 ft., or 37 ft. higher than the discovery well. However, the section was composed of broken sand and shale and was logged as carrying gas-distillate. Correlated on the lower sand topped at —6,187 ft., the outpost is 40 ft. structurally higher. This lower sand was tested in the discovery well, but showed salt water and a small amount of oil.

Limiting the field on the southeast side, Jay



Map of the Caesar field, Bee County, showing trend of Carrizo-Wilcox sand development just south of the field. Two producing wells are shown by circles with locations and active wells indicated by broken circles. This discovery is regarded as the most important development in Southwest Texas in several months and the area is expected to receive considerable development

Simmons 1 Cotton has been abandoned at 6,632 ft. The upper sand was topped at —6,098 ft., 1 ft. higher than in the discovery well and the lower sand was found at —6,217 ft., or 30 ft. lower than in the Luling producer. Although live oil was produced on a drill-stem test, the sand has begun to shale out and only 11 ft. was logged of which the greater part showed no oil. Whether production may be obtained even farther down the structure, provided porosity and permeability is found, may be determined by Atlantic 2 Grisson, 2,000 ft. south of the discovery. This well was reported running about 90 ft. low at the 5,000-ft. level.

While the trend of drilling cannot be accurately determined due to lack of development, production from the two sands is expected to be governed by position on structure. Wells which find gas-distillate in the upper sand may carry oil in the downdip sector. From subsurface and geophysical information, the discovery well appears to be located just off the apex of the structure. It is doubtful if production will extend into the Caesar field proper due to a fault extending along the northeast-southwest limits of the field.

Leasing in this area was started in September of last year by John Carter and C. C. Bishop of Houston, Tex., who assembled a block of approximately 4,500 acres centering in the McEarly and Powell Surveys. The acreage was leased on the strength of subsurface work, which was later checked with geophysical instruments by the Atlantic Refining Co. The ownership of the area is divided among several companies and independent operators and an active drilling program is anticipated in light of recent developments.

Atlantic Takes Over Slick Holdings

Atlantic Refining Co. recently took over all of the Slick estate's holdings comprising some 2,400 acres, and the company is obligated to drill three wells and take care of any offset obligations. The company is now drilling below 4,000 ft. in 2 Grissom in the Gant Survey, about 2,000 ft. south of the discovery well. The outcome of this test is being watched with considerable interest as it will have much bearing on future developments. In the meantime, Luling Oil & Gas Co. has applied for a permit to drill 2 Slick, located about 1,000 ft. due east of its deep producer, while Jay Simmons made application for a permit for 2 Cotton, approximately 2,000 ft. north of 1 Cotton and just south of the Luling location. Offsetting the Simmons location to the east, Continental Oil Co. has made tentative location for 1 M. T. Fox.

Other major companies and independent operators holding close in protection include: Tide Water Associated Oil Co., Seaboard Oil Co., George Strake, Southwood Petroleum Co., Superior Oil Co., John Carter, Mills Bennett Production Co., and Midstates Oil Co.

As a result of this discovery, special attention is being paid to other old Pettus sand fields, many of which are practically depleted but which can be regarded as favorable prospects in light of recent developments. Deeper drilling is already under way at the Tuleta and West Tuleta fields where two deep tests are being drilled by the Tide Water Associated Oil Co. and Dirks Brothers. In the meantime, several thousand acres are said to have been assembled along this particular trend, centering largely around the edges of old fields. A recent survey showed that 12 fields in this county were still producing with the daily average production ranging from 5 to 720 bbl. These fields include: Caesar, Diamond Halff, Dirks, Holzmark, McMurray, Normanna, Pettus, Plummer, Ray, Shield, Tuleta, Tulsita and Voss. This group does not include several other fields classified as gas fields. With few exceptions these structures are very similar to one another with accumulation resulting from closure against faults.

The search for Carrizo-Wilcox production in Southwest Texas is in many respects following the same pattern as that of the upper Gulf Coast district which went through a long period of disappointments before any appreciable results were obtained. Operators working in the latter area have adjusted their method of exploration to fit in with new conceptions in light of recent developments, and while there is still much to be learned, the rate of new discoveries has been increased during the past 2 years. The Southwest Texas sector is going through the same stage. While development in this area has not been as extensive as the upper Gulf Coast, the South Caesar discovery, opening of important shallow Wilcox production in the Washburn area, La Salle County, and the information obtained from several deep tests are regarded as highly significant and future exploration will be governed by these developments.

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April Completions Show Small Increase; Fewer Drilling Wells

COMPLETIONS reported during April were 135, or over 10 per cent above those reported in March. This increase is in part due to the fact that in some areas wells are reported on a weekly basis and April was a 5-week month in those sectors. This difference is not, however, responsible for the increase of nearly 100 per cent in both Kansas and California.

Prior to this month, water-input wells have been reported as oil wells in the Bradford-Allegheny district. In conformity with other areas, these have been dropped from the accompanying table and March completions have been adjusted so as to conform. This area, together with the remainder of the Appalachian district, contains more than 20 per cent of the completions with 40 per cent of the gas wells. Despite the deep Oriskany drilling in West Virginia, the footage drilled in this area is only about 12 per cent of the total.

In the eastern area, Ohio and Michigan show considerable increases in activity, with Illinois and Indiana running only slightly ahead of last month. Discoveries in both Ohio and Michigan will probably result in further increases.

In the Mid-Continent area, only Kansas shows much increase in drilling. Oklahoma is running steady and M-68 and proration have combined to cut North and West Central Texas. The Coastal area shows little change, although the Lower Gulf and Louisiana sectors are more active while South Central Texas has fallen off sharply.

Less significant than the increase in completions is a decline of 149, or about 6 per cent, in wells reported as drilling at the end of the month. It is impossible to state the exact change in real activity as some of the wells dropped have been inactive for some time. It is quite possible that actual drilling has increased, although it is impossible that this increase is proportional to the number of completions and a decline may be expected in May.

In West Texas, where 40-acre spacing is not uncommon, M-68 has had much less effect on drilling than the sharp reduction in production. Discoveries in this area are keeping at a high level and, under normal conditions, it would not show a decline of nearly 50 per cent from last fall. The more important of the new fields are on University lands where large blocks under a single lease are the rule so that slow development is possible.

From the standpoint of the present market situation, it is interesting to note that completions in Illinois have dropped to about 22 per cent of the level reached last September. Oklahoma and Kansas have declined 50 and 40 per cent, respectively, from that time. In other words, the areas from which oil can be moved to the more important markets do not appear to be in a position to continue to satisfy present requirements for more than a short time. Recent discoveries in these states have been few and relatively unimportant.

SUMMARY OF OPERATIONS, ALL FIELDS, APRIL

	Comp.	Oil	Prod.	Gas	Dry	Completions: Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Footage	Drlg.
Appalachian*	298	217	503	66	15	7	236	31	24	0	618,907	276
Ohio	88	20	1,221	35	33	19	32	37	0	0	191,376	144
Indiana	32	17	907	0	15	4	16	12	0	0	54,888	46
Kentucky	27	5	70	17	5	3	9	15	0	0	69,965	59
Michigan	55	32	33,955	3	20	3	13	39	0	0	154,544	111
Illinois	100	45	8,656	0	55	1	30	69	0	0	276,333	195
Kansas	131	62	39,917	4	65	0	24	105	2	0	426,407	138
Nebraska	3	1	20	0	2	0	1	2	0	0	9,810	6
Missouri, Iowa	3	0	0	0	3	3	0	0	0	0	771	3
Oklahoma	98	40	13,927	8	50	7	31	47	13	0	312,094	189
North Texas	48	27	8,849	0	21	5	19	16	8	0	131,822	70
West Central Texas	18	7	569	1	10	0	11	6	1	0	48,549	40
Northern West Texas	69	66	58,923	0	3	0	1	11	57	0	331,703	106
Southern West Texas	53	34	34,529	4	15	4	8	33	8	0	207,022	126
Texas Panhandle	14	14	1,813	0	0	0	0	14	0	0	47,189	33
East Texas	27	18	2,881	1	8	0	0	20	7	0	147,001	33
Upper Gulf Coast	53	40	8,067	2	11	0	0	2	45	6	366,283	88
Lower Gulf Coast	72	40	4,602	9	23	0	0	6	66	0	453,960	55
South Central Texas	9	4	42	2	3	5	2	2	0	0	19,548	19
South Texas	55	17	2,148	1	37	0	13	35	7	0	185,405	32
Southeast New Mexico	15	11	1,329	1	3	2	0	13	0	0	47,915	70
Arkansas	14	9	2,426	0	5	0	0	4	9	1	81,087	27
North Louisiana	45	32	17,432	0	13	1	3	19	22	0	197,740	53
Louisiana Gulf	46	32	8,604	1	13	1	0	5	18	22	410,228	85
Mississippi	9	4	1,009	0	5	0	5	4	0	0	50,245	13
Alabama	1	0	0	0	1	0	0	1	0	0	4,043	5
Georgia	0	0	0	0	0	0	0	0	0	0	0	1
Montana	12	4	56	4	4	2	4	6	0	0	26,002	65
Wyoming	4	2	341	1	1	2	0	1	1	0	10,651	57
Colorado, Utah	0	0	0	0	0	0	0	0	0	0	0	36
Northwest New Mexico	0	0	0	0	0	0	0	0	0	0	0	13
California	50	26	16,137	2	22	1	8	11	22	8	314,062	74
Florida	0	0	0	0	0	0	0	0	0	0	0	3
Total April	1,449	826	268,973	162	461	70	466	566	310	37	5,196,230	2,270
Total March	1,314	766	243,526	144	404	73	443	502	271	25	4,724,280	2,419
Difference	135	60	25,447	18	57	3	23	64	39	12	471,950	149

*Water-input wells omitted. These totaled 159 in March and 179 in April.

Antelope Plains Heavy-Crude Discovery Flows 937 Bbl.

By L. P. STOCKMAN

LOS ANGELES, Calif.—Shell Oil Co., Inc., has officially completed 45-6 Williams in the Antelope Plains section of Kern County flowing 937 bbl. per day of clean 16.4-gravity oil and in doing so has discovered a new oil field in the San Joaquin Valley that appears to be a discovery of possible major importance at least under present conditions and in view of the high demand for fuel oil which is a problem of considerable importance. The discovery well, 45-6 Williams in 6-28s-20e, was bottomed in oil sand at 2,340 ft., has a 7⅝-in. water string cemented at 2,280 ft. and a string of 3-in. tubing hung at 2,268 ft. with a packer at 2,182 ft. Initial flow was through open line behind a tubing pressure of 40 lb. Production, according to Shell, is coming from approximately 60 ft. of oil sand of middle Miocene age and the hole was bottomed in the pay.

This new oil field is located in northwestern Kern County in a relatively flat area about 5 miles west of the southern tip of the North Belridge field. About 10 miles west of the Antelope Plains, outcrops in the Temblor Range indicate the formations penetrated by the discovery well and reveal the possibility that a much greater thickness of oil sand may be present.

Shell's new well began showing oil and gas on the ditch almost from the grass roots down and at 1,760 ft. the bit drilled through a relatively hard brown shale into a gas zone and on a subsequent formation test at 1,769-1,829 ft., open 2 hours, the well flowed gas at a daily rate of 1,350,000 cu. ft. through a 48/64-in. bean. Bottom-hole pressure at this depth was 375 lb. On a second formation test at 1,829-1,970 ft. the well showed a potentiality of 6,000,000 cu. ft. of gas per day. The hole was cored almost solidly from 1,766 ft. and the interval from 1,766 ft. to 2,219 ft. consisted of alternating porous and tight oil and gas sands. This section presents commercial gas possibilities and small production of heavy crude oil may later be developed above the present productive zone. The demand for heavy grades of crude oil which form the basis of plans to meet the demand for fuel oil which has greatly exceeded the capacity of operators to produce makes Shell's discovery a very important factor as the well produces a grade of crude oil that is in high demand at present. Recognizing this and due to drilling obligations, the company has already staked location for a second well to be drilled at once and this new project should shed some additional light on the productivity of the field as it has been tentatively planned to carry the second well down for a deep test.

The discovery well in the Antelope Plains section of Kern County was drilled with portable equipment which has already drilled wells in the Capitan field of Santa Barbara County and several wildcat wells in the San Joaquin Valley as well as in the Dyer Creek field which Shell discovered several months ago but in which the company has not been able to complete a second well. Dyer Creek is a fault trap and drilling operations to date indicate the probability that it is very narrow and of doubtful commercial value. Shell's portable drilling equipment is ideally suited for development work in the Antelope Plains field of Kern County and was fabricated for just this type of work. Shell found this new field by a combination of core-hole drilling, seismograph work and excellent geological work. Location for the second well to be drilled at Antelope Plains is southeast of the discovery well, but this may possibly be changed between now and time to spud.

Additional Development Started at South Belridge

The South Belridge field of Kern County, located southeast of Shell's newly discovered Antelope Plains field, is becoming active again after a period of inactivity and a number of additional wells will be drilled during the next several months as operators are developing everything that could produce additional supplies of heavy crude oil to meet the demand for fuel oil. At South Belridge, Union Oil Co. has completed its first productive well on the Hopkins property in 4-29s-21e and has 81-5 Hopkins in 5-29s-21e ready for the pump. A third well has been located in 10-29s-21e and drilling will start within another week or 10 days. The Hopkins property has not hitherto been productive as the wells are very small, averaging around 10 bbl. per day. General Petroleum Corp. has resumed drilling in 3-29s-21e and will drill at least two additional wells to the shallow zone encountered at depths ranging from 800 to 1,100 ft. In the North Belridge field of Kern County, where approximately 60 per cent of the gas and only about 20 per cent of the crude oil has been recovered, drilling operations are restricted to one well under way by Tide Water Associated Oil Co. and two being drilled by Belridge Oil Co.

Wildcat Activity

In contrast with the success of Shell Oil Co. in discovering a new oil field in the Antelope Plains section of Kern County, there are a number of wildcats in other areas that do not look any too good at the present time. In the Quijarral Hills section of Fresno County, R. S. Lytle found the Vaqueros barren and is now making hole in the Kreyenhagen just above the Eocene. This wildcat has reached the critical stage but the Eocene is really the objective and for this reason its status should be determined within the next 2 weeks. In the Cantua district of Fresno County, Richfield Oil Corp. is spot coring in the Eocene and should likewise be able to determine the wildcat's potentiality within a short time. The Kreyenhagen was logged in this well at 7,871 ft. and top of the Eocene was cored at 8,800 ft. The formation from 8,800 ft. to 8,895 ft. in the top of the Eocene consisted of gray sand. In the Panoche district of Fresno County where Jergins Oil Corp. made a discovery of undetermined importance over a year ago, 3 Chaney Ranch is being delayed pending completion of work repairing equipment. This well still has another several hundred feet to go before reaching the Cretaceous in which the initial discovery was made.

Standard Oil Co. has staked location for a semi-wildcat to be drilled out on the Kern River front in 9-28s-27e and this well will be drilled along the north line of the section on fee-owned acreage. In the Edison field of Kern County, Paul Getty failed to find commercial production in 1 Mattson in 6-30s-29e and the hole is being abandoned at 6,764 ft. At Mount Poso Signal Oil & Gas Co. went through a fault in 2 Bishop in 22-27s-28e and the hole is being plugged back from 1,532 ft. in order to redrill and deviate the hole away from the fault zone. Standard Oil Co. is preparing plans for an extensive development program in the Midway-Sunset field of Kern County and locations or rigs standing already total 12. These new wells to be drilled include two in 11-32s-24e, three in 15-32s-24e, five in 27-31s-23e and two in 35-31s-23e. Standard's plans for this area contemplate the drilling of 25 wells during the current year provided sufficient equipment can be secured. This not only means drilling equipment but also pumping units as well as most of the wells scheduled to be drilled will require artificial stimulation to show production.

SAN JOAQUIN VALLEY COMPLETIONS

Antelope Plains, Kern County: Shell Oil Co., Inc. 45-6 Williams, 6-28s-20e, flowed 937 bbl., 16.4-gravity, 0.5 per cent cut, 10,000 cu. ft. gas, 48/64-in. bean, T.P. 40 lb., T.D. 2,340 ft., perf. 2,280-2,340 ft., discovery well in new oil field, producing from oil sand of middle Miocene age.

Belridge, South, Kern County: Union Oil Co. 85-4 Hopkins, 4-29s-21e, pumped 20 bbl., 11.5-gravity, 30 per cent cut, T.D. 1,444 ft., P.B. 880 ft., perf. 877-880 ft., completed in upper zone of Pliocene age.

Edison, Kern County: Paul Getty 1 Mattson, 6-30s-29e, dry in Walker sand and shale, T.D. 6,764 ft., Wicker zone which consisted of shale was cored at 4,205 ft.

Jasmine wildcat district, Kern County: R. S. Bolling 1 Quinn, 14-25s-27e, dry, T.D. 2,927 ft., only stringers of oil sand found at this location.

Kern River, Kern County: Oils, Inc., of California 2 Seven Spot, 13-28s-27e, abandoned as dry hole, T.D. 1,289 ft., failed to find sufficient oil sand in Kern River series to produce commercially.

Stephens Oil Co. 3 Kern, 34-28s-28e, failed to find enough oil sand to produce, T.D. 487 ft., only thin oil sand lenses found at this location.

Midway-Sunset, Kern County: General Petroleum Corp. 340-34-C Moco, 34-12n-24e, pumped 25 bbl., 13.2-gravity, 45 per cent cut, T.D. 959 ft., perf. 476-572 ft., 643-958 ft., completed in shallow zone of Pliocene age.

Raisin City, Fresno County: Shell Oil Co., Inc. 33-19 Santa Ana & Fresno Land, 19-15s-18e, flowed 360 bbl., 23.9-gravity, 0.7 per cent cut, 120,000 cu. ft. gas, 16/64-in. bean, pressures 275/175 lb., T.D. 5,245 ft., perf. 5,205-45 ft., completed in Seaboard zone of Miocene age.

Redwood City wildcat district, San Mateo County: Ra-Lite Petroleum Co. 1 Bell, 16-7s-4w, dry, T.D. 1,005 ft., no oil sand logged.

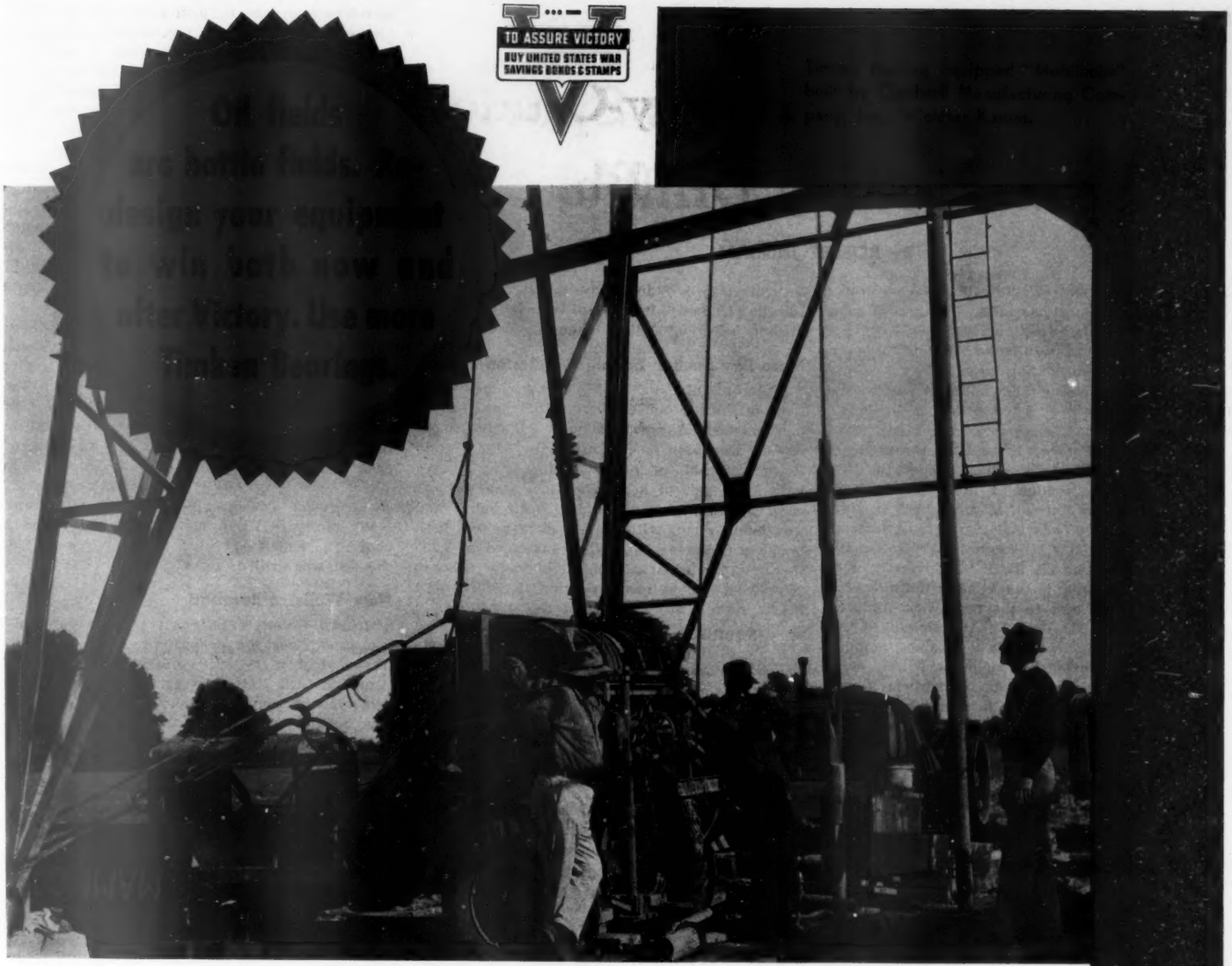
Tupman, Kern County: Richfield Oil Corp. 67-27-C Kern County Land, 27-30s-25e, flowed 825 bbl., 32.8-gravity, 3 per cent cut, 900,000 cu. ft., two 96/64-in. beans, pressures 70/750 lb., T.D. 9,547 ft., P.B. 9,380 ft., completed in Stevens zone of Miocene age, N point 9,037 ft., top oil sand 9,307 ft.

Standard Oil Co. 22-43 Kern County Land, 31-30s-25e, pumped 171 bbl., 32.9-gravity, 0.6 per cent cut, T.D. 9,076 ft., P.B. 8,990 ft., N point 8,028 ft., completed in Stevens oil sand of Miocene age.

Third Turnbull Canyon Test Running Structurally Low

Developments in the Turnbull Canyon field of Los Angeles Basin during the past week were unfavorable but by no means conclusive as Continental Oil Co. at the close of the week had not yet picked up the pay in 3 Turnbull Community with bit down 3,985 ft. This means that the present well is running several hundred feet lower structurally than either the discovery well or the company's second completion. No evidence of faulting of any great consequence has been noted and the only thing that can be deduced from the present status of the well is that the structure is plunging off faster than anticipated. On the basis of work done up to the present one is not certain whether Turnbull Canyon field will prove of primary or secondary importance from a production standpoint. When the field was discovered it was believed that the productive acreage might approximate 640 acres but Continental Oil Co. subsequently ran into a fault in the southern part of the field that definitely reduced the amount of potentially productive acreage. Now it looks like the total productive acreage may be reduced to around 400 acres but this may vary one way or another. The discovery well was finished as a pumper but the second completion, located higher structurally, resulted in a natural flow approximating 1,200 bbl. per day. The third well now being drilled is lower structurally than both of the

(Continued on Page 86)



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Important Discoveries Spur Andrews County Drilling

By ROBERT INGRAM

MIDLAND, Tex. — Drilling booms looked like a thing of the past after Preference Order M-68 was issued last December. But last week one was developing in southwest Andrews County. Reason: Operators holding large University lease blocks began proving their holdings late in the winter and last week had opened at least two new pools and had showings of one more, all of which were covered by leases soon to expire.

Phillips Petroleum Co., which opened the first Ellenburger lime production in the county (see The Oil and Gas Journal, May 14, 1942, p. 108), had staked two offsets and two outpost tests to the discovery well, 2 (formerly 1-A) University-Andrews in Section 30, Block 10, University Survey, and two offsets to the Atlantic Refining Co.'s south extension well to the new West Andrews pool, in Section 23, Block 11. Atlantic staked two outposts from its extension well and Stanolind Oil & Gas Co. started one farther north.

Meantime, Mascho Oil Co. brought in a well last week 3 miles east of the Phillips discovery and promptly Skelly Oil Co. and Magnolia Petroleum Co. announced outposts near the Mascho well. The Texas Co. already had a wildcat under way in Section 10, Block 10, making a total of 15 operations started or scheduled in the area. Another rig was running a little farther north in the new West Fuhrman area.

Both Permian and Ordovician pays were being sought as a result of the Phillips well. Several weeks ago it tested oil and gas through drill stem in a lower Permian zone between 6,100-6,500 ft. in sufficient quantity to assure a new field, then went on to flow more than 100 bbl. an hour through open tubing from Ellenburger topped at 7,750 ft. Final gage last week gave the well a 2,887-bbl. potential. Four of the new Phillips tests will try for Permian pay, two for the Ellenburger.

The Mascho Oil Co. 1 Sun-University, east and a little north of the Phillips area, brought in production from Permian lime at 4,340 ft., approximately 200 ft. below the pay horizon in the Emma pool, 2 miles southeast.

The well swabbed 10 bbl. an hour at midweek. Testing was through 2-in. tubing set at 4,506 ft. with a flow packer at 4,340 ft. and perforations in the tubing at 4,436 ft. Total depth was 4,514 ft. The well flowed ahead of the swab but not steadily and the flow valves may be installed in the tubing. Location is 660 ft. out of the NE cor. Section 27, Block 10.

At the same time the rig in the West Fuhrman area, Siemoneit Drilling Co. 1 University, indicated a 1½-mile south extension when it filled 400 ft. with oil while shut in 18 hours, then swabbed an estimated 4 to 5 bbl. an hour. The well, bottomed at 4,580 ft., was again shut in pending further tests. It it located 660 ft. out of the SE cor. Section 10, Block 10.

No Outpost at Nairn

Abandoned was Texas Pacific Coal & Oil and Seaboard Oil Co.'s location in Lubbock County (Section 41, Block A), which would have thrown some light on subsurface conditions at the Nairn discovery 1½ miles southeast. Operators had started moving in material to protect their lease, but obtained a renewal at the last minute and cancelled plans to drill. Seven miles southeast of the Nairn well, Stanolind 1 Stinnett, Labor 18, League 4, San Augustine C.S.L. Survey, was drilling below 6,860 ft. in lime.

More Pay Section Found at Fullerton

Fullerton Oil Co. 3 H. M. Wilson, fourth deep Permian lime producer in the Fullerton field in northwestern Andrews County, obtained more pay in deepening from 7,294 ft. to 7,277 ft. and flowed 296 bbl. in 9 hours after being treated with 7,000 gal. of acid. The flow was through open 2½-in. tubing which had been pulled and was being rerun without a packer to test both upper and lower pays. When bottomed at 7,205 ft., the well flowed 22 bbl. an hour for 6 hours after acid. The well is in Section 15, Block A-32, P.S.L. Survey, 330 ft. west of the discovery.

NORTHERN WEST TEXAS COMPLETIONS

Fields

Slaughter, Cochran County: Devonian Oil 2-B J. S. Smith, 580 ft. from N and W lines, Lab. 16, Lge. 56, Oldham C.S.L. Sur., elev. 3,678 ft., flowed 888 bbl. through casing after acid, pay 4,999 ft., T.D. 5,049 ft.

Honolulu 8-58 Dean, 580 ft. from N and W lines of lease in Lge. 58, Martin C.S.L. Sur., flowed 401 bbl. through 2½-in. casing outlet after acid, pay 4,910 ft., T.D. 5,027 ft., P.B. 5,018 ft.

Honolulu 41-7 Igoe & Smith, 665 ft. from S and E lines of Lab. 7, Lge. 56, Oldham C.S.L. Sur., elev. 3,669 ft., flowed 855 bbl. through 2½-in. casing outlet after acid, pay 4,986 ft., T.D. 5,025 ft.

Honolulu 42-15 Igoe & Smith, 560 ft. from S and W lines of Lab. 15, Lge. 56, Oldham C.S.L. Sur., elev. 3,678 ft., flowed 1,040 bbl. through 2½-in. casing outlet after acid, pay 5,021 ft., T.D. 5,053 ft.

Honolulu 43 Igoe & Smith, 665 ft. from S and E lines, Lab. 6, Lge. 56, Oldham C.S.L. Sur., elev. 3,661 ft., flowed 866 bbl. through 2½-in. casing outlet after acid, pay 4,963 ft., T.D. 5,010 ft.

Honolulu 18-A Mallett, 580 tf. from W and S lines, Lab. 4, Lge. 51, Scurry C.S.L. Sur., elev. 3,649 ft., flowed 812 bbl. through 2½-in. casing outlet after acid, pay 5,058 ft., T.D. 5,080 ft., P.B. 5,072 ft.

Superior 5 Dean, 440 ft. from W line and 1,573 ft. from S line, Lge. 57, Martin C.S.L. Sur., elev. 3,683 ft., flowed 173 bbl. through casing after acid, pay 4,915 ft., T.D. 4,997 ft.

Slaughter, Hockley County: Honolulu 30-B Slaughter, 665 ft. from S and E lines, Lab. 22, Lge. 37, Zavalla S.C.L. Sur., elev. 3,536 ft., flowed 1,137 bbl. through 2½-in. casing outlet after acid, pay 4,930 ft., T.D. 5,025 ft.

Texas 7-C Mallett, 580 ft. from W and S lines, Lab. 13, Lge. 51, Scurry C.S.L. Sur., elev. 3,616 ft., flowed 933 bbl. through casing after acid, pay 5,012 ft., T.D. 5,051 ft.

Texas 133 Slaughter, 580 ft. from N and E lines, Lab. 83, Lge. 38, Zavalla C.S.L. Sur., elev. 3,559 ft., flowed 1,408 bbl. through casing after acid, pay 4,968 ft., T.D. 5,020 ft.

Slaughter, Terry County: Honolulu 16 Frazier, 440 ft. from S and E lines, Sec. 10, Blk. X, P.S.L. Sur., elev. 3,522 ft., flowed 1,813 bbl. through 2½-in. casing outlet after acid, pay 4,930 ft., T.D. 5,030 ft.

Wasson, Yoakum County: American-Liberty 5 Herd, 1,980 ft. from S and W lines, Sec. 795, Blk. D, J. H. Gibson Sur., elev. 3,659 ft., flowed 504 bbl. oil plus 3 per cent water through tubing on gas lift after acid, pay 4,995 ft., T.D. 5,235 ft.

Flow Improved by Acid at West Texas Deep Discovery

While Shell Oil Co., Inc., was completing 1 Sealy-Smith Foundation in Ward County to open West Texas' deepest oil production from the Ellenburger at a total depth of 10,111 ft., another wildcat was abandoned in Upton County at 10,018 ft., still short of the Ellenburger but with hole left in condition for deepening in the future. Some geologists expressed the opinion that the Upton County well (see completions) was only some 90 ft. short of the Ellenburger.

The Sealy-Smith discovery, assured 2 weeks ago, was improved by acid treatment. It flowed 120 bbl. natural through 2-in. tubing in 24 hours. Then, after injection of 5,000 gal. of acid, the well cleaned up and flowed at the rate of between 64 bbl. and 80 bbl. an hour for 8 hours, again through 2-in. tubing. Casing pressure was 1,250 lb. and gas-oil ratio was 1,750:1. Oil tested 47 gravity.

Location of the well is 2,310 ft. from the south line and 330 ft. from the east line of Section 38, Block A, G.&M.M.B.&A. Survey, 2½ miles northeast of Monahans and 7 miles east of the O'Brien sector of the North Ward field. The nearest Ordovician production is in the Sand Hills field in southwestern Crane County, 15 miles to the southeast.

Only one other deep-exploration attempt has ever been made in Ward County and it, too, was successful. Gulf Oil Corp. found a show of oil in the Ellenburger in its first deep hole on the Wristen ranch, but junked the bottom part of the hole and never made a production test in the Ordovician. Instead the well was plugged back to bring in the first Silurian lime field in West Texas from 7,000 ft. A second test on the same prospect was completed in the same zone.

Whether Shell's discovery found any shows above the Ellenburger has not been reported as the test was drilled "tight."

New Wells at Barnhart

Reagan County's Barnhart pool, which until last week, was the deepest production in West Texas, had a 1½-mile southeast extension at Amerada 1-RE University (see completions). The other completion, Amerada 1-A-RC University, was between the 1-RD University and the discovery well and was a twin to the 1-RC University, a dry hole abandoned November 25, 1941, at 2,730 ft. All pay is from the Ellenburger, at around 9,200 ft.

Deep Sterling County Wildcat

Further interest in Ordovician possibilities was shown at Gulf Oil Corp. 1-C W. L. Foster, Section 28, Block 12, S.P. Survey, 2½ miles south and a little east of Sterling City in Sterling County. This was another "tight" hole and information was scarce but operator was running 5½-in. casing at a total depth of 8,117 ft.

Sterling County is well to the east of the trend of production in the Permian basin although four shallow producers were drilled in the Clark area some years ago. Wildcatters have tested much of the county without success but still show interest.

Adjoining the county on the southeast is Tom Green County where a lone producer, drilled 2 years ago by B. C. Mann of San Angelo on the Joe Funk ranch and shut in most of the time for lack of an outlet, has pumped 42 bbl. of 35-gravity pipe-line oil on a plain retest. Production is from the Blaine lime at 1,123-27 ft. At the time the retest was made, it was announced that the Texas Co. had taken 10-year commercial leases on approximately 9,000 acres around Tankersly along the west side of the Middle Concho River and north of Spring Creek.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

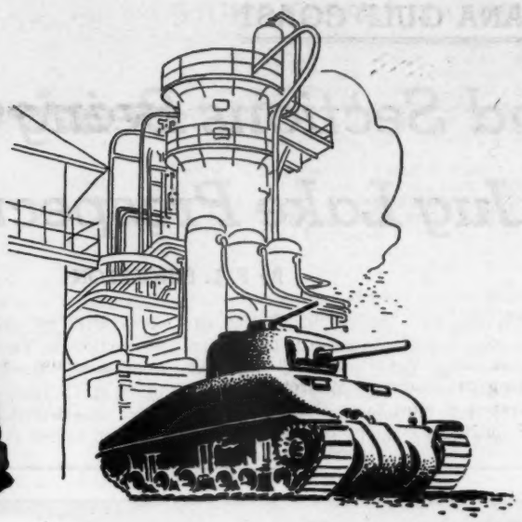
Lubbock County: Texas Pacific C. & O. and Seaboard Oil 1 F. W. Austin, 660 ft. from S and E lines of Sec. 41, Blk. A, approximately 1½ mi. NW of Nairn pool, location abandoned after lease was renewed.

Upton County: Plymouth Oil 1 D. L. Alford, 467 ft. from S and E lines of NW Sec. 50½, P. B. Scott Sur., 10 mi. NW of Big Lake field, dry, hole filled with mud, anhydrite 1,210 ft., Yates frosted quartz grains 2,110 ft., top splintery black shale 9,590 ft., top Devonian 10,018 ft., T.D. 10,384½ ft.

Fields

Abell, Pecos County: Magnolia 4 Crockett, 660 ft. from S and E lines, Lot 10, Sec. 4½, Blk. 3, H.&T.C. Sur., elev. 2,389 ft., flowed 389 bbl. through ½-in. tubing choke after acid, pay 5,820 ft., Simpson 4,900 ft., McKee sand 4,964 ft., Waddell 5,435 ft., Ellenburger 5,805 ft., T.D. 5,897 ft.

(Continued on Page 88)



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For want of a tank an army was lost!

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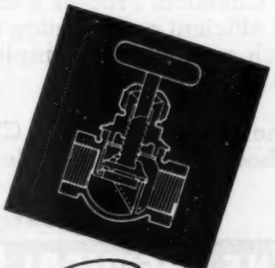

1885
Taken from one of the original Pratt & Cady Globe Valve patent drawings

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LOUISIANA GULF COAST

Sand Sections Being Tested On Jug Lake Prospect

By F. L. SINGLETON

NEW ORLEANS, La.—Interest in wildcat operations along the Louisiana Gulf Coast was centered on the Jug Lake prospect, southern Terrebonne Parish where Superior Oil Co. 1 La Terre, 27-19s-15e, was bottomed at 11,055 ft., and preparations were being made to cut side-wall cores after an electrical survey showed possible production in two sand sections. The sand sections were logged at 9,943-52 ft., and at 10,168-10,230 ft. Correlated with Continental 1 La Terre, a dry hole drilled in the area several months ago, the well is 260 ft. structurally higher.

Pure 1 Vermilion Irrigation Co. which showed promise of opening crude production from a deeper sand in the West Gueydan field, Vermilion Parish, now looms as a gas-distillate producer. This well was originally tested through perforated casing at 10,792-97 ft., and flowed at the rate of 40 bbl. of pipe-line oil per hour. However, salt water broke in and the well was killed. The new test was made at 10,783-92 ft., from which it flowed an unestimated amount of gas and distillate through a ⅛-in. choke with tubing pressure at 3,400 lb. Within a short time the flow lines began to freeze and the well was shut in preparatory to installing bottom-hole chokes. Additional development is expected to be started on the structure which heretofore has produced from two sands at 6,600 and 7,000 ft.

Discovery May Link Bayou Sale And Horseshoe Bayou Production

That production of the Bayou Sale field, St. Mary Parish, may be joined with that of the Horseshoe Bayou field to the south was indicated by the opening of gas-distillate production from a deeper sand in the extreme south end of the field. The discovery was made by the completion of Atlantic 3 St. Mary Parish Land Co., which is flowing at the rate of 62 bbl. of distillate daily through a $\frac{3}{16}$-in. choke from perforated casing opposite sand at 10,703-30 ft. This new sand is approximately 400 ft. deeper than the 10,300-ft. sand that was opened by the same company several months ago.

The well was drilled to a total depth of 12,404 ft., and an electrical survey showed possible production in other sand and sandy-shale sections at 11,483-11,506 ft., 11,170-11,230 ft., 10,696-10,717 ft., 10,626-54 ft., and 10,116-10,220 ft. In view of the high pressures encountered at the total depth no electrical survey was made below 11,990 ft., although a mud log indicated oil and gas shows at 12,060-12,100 ft. and 12,340-50 ft. Drill-stem testing through perforated casing at 12,087-99 ft., and 12,085-95 ft. recovered salt water with a slight show of oil and gas.

Bayou Sale is located approximately 2½ to 3 miles north of the Horseshoe Bayou field which produces from several sands at intervals from 10,787-11,792 ft. In view of the many sands logged by the Atlantic producer, it is generally believed that these sands correlate with those at Horseshoe Bayou and development in this direction will be watched with much interest.

Northeast of the Lewisburg field, Acadia Parish, Stanolind 1 M. G. Dohmann was preparing to squeeze off perforations a second time after the well flowed salt water with a show of gas when tested through perforated casing at 10,685-10,701 ft. A test the previous week at 10,685-10,720 ft., showed the same results and the chances of opening production from a new sand several hundred feet deeper than the discovery pay at 10,200-10,300 ft. are not encouraging.

On the south flank of the Edgerly field, Calcasieu Parish, Gulf Refining Co. cemented a protection string of casing in 1 Louisiana Sulphur Mining Co., and is preparing to drill ahead. This is the second projected deep test to be drilled on the structure by the company which previously logged high pressures at approximately the same depth in an abandoned well.

Texas 1 LeDanois Land & Stone Co., located on the south flank of the Pine Prairie field, Evangeline Parish, is drilling in a sidetracked hole at 7,426 ft., after plugging back from a total depth of 9,490 ft. The well is reported to have logged favorable indications, but no details are available.

Titanic 2 Marrero, which is attempting to open production from a new sand in the Westwego field, Jefferson Parish, is temporarily shut down for orders after the well showed salt water and some gas when tested through perforated casing at 10,430-50 ft. This sand section is several hun-

(Continued on Page 77)

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ILLINOIS FIELD REPORT

Big Flow From McClosky in Wayne County Wildcat

MATTOON, Ill.—One of the most closely watched tests in the state, Texas Co. 1 H. H. Mayberry, NW SE 7-3s-6e, a wildcat west of Mayberry in Wayne County, came in flowing at the rate of 898 bbl. in 12 hours, through casing, early last week to be hailed as one of the best finds of the year. At the end of the week the test was still flowing steadily at the rate of 810 bbl. in 11 hours. Production is from a saturated zone in the McClosky at 3,333-48 ft. The well has not been acidized and is more than 6 miles from substantial production. It is not only the largest wildcat completion of 1942 but appears to be one of the best wells drilled in the state for several months.

No. 1 H. M. Mayberry is about 1 mile west of Texas 1 F. N. Draper, W½ NW SW 8-6s-3e, which was completed in August of last year as the discovery well of the Mayberry pool. No. 1 Draper was completed as a small McClosky pumper and initialed 75 bbl. daily. Production was obtained at 3,352-80 ft. No additional drilling was done in the pool until the present time.

With the entire tract under lease by the Texas Co., development may not be as rapid as would be the case if competition were a factor. However, several offsets have already been staked in the area. These include Texas 1 B. Taylor, N½ SW NE 7-3s-6e, which has derrick up, and Texas 1 G. Scott, N½ SW SE 7-3s-6e, a location.

Gallatin County Test Opens New Pool

R. Bruce Martin 1 L. Bahl, pool-opening well, 5 miles west of the Inman field, has been completed on pump and is making an estimated 110 bbl. daily. The well is producing naturally from the Cypress sand at 2,482-97 ft. It is located in SE SE NW 18-8s-9e.

Meanwhile, a wildcat more than a mile southwest of the discovery, Martin 1 Leon Minor, SE NE SE 28-8s-9e, was rigging up rotary tools.

A wildcat about 1½ miles northwest of Bone Gap in Edwards County, Charles Steele et al 1 Couch, 330 ft. from south line and 1,160 ft. from west line, 6-1s-11e, still is testing the McClosky at 3,253-59 ft. On its most recent test the well swabbed 70 bbl. of oil and 8 bbl. of water following a 500-gal. acid treatment.

ILLINOIS COMPLETIONS

Wildcats

Clay County: Eason Oil 1 A. Miller, SW NE 35-5n-6e dry at 2,924 ft., Menard 2,118 ft., Tar Springs 2,255 ft., Glen Dean 2,311 ft., Golconda 2,378 ft., Barlow 2,477 ft., Cypress 2,538 ft., Paint Creek 2,621 ft., Benoist 2,667 ft., Renault 2,712 ft., Aux Vases 2,728 ft., Ste. Genevieve 2,773 ft., Rosiclare 2,794 ft., Fredonia 2,805 ft.

Clinton County: E. Frank Jones 1 Harrison, NE SE NW 2-2n-2w, pumped 264 bbl., natural, Benoist 1,212 ft., T.D. 1,221 ft., *pool opener.*

Hamilton County: Seaboard 1 Xavier 1 Kiefer, S½ SE SW 30-3s-5e, dry at 3,404 ft., Menard 2,314 ft., Vienna 2,430 ft., Tar Springs 2,437 ft., Glen Dean 2,530 ft., Hardinsburg 2,580 ft., Barlow 2,778 ft., Cypress sand 2,868 ft., Benoist 2,974 ft., Renault 3,004 ft., Aux Vases 3,092 ft., Ste. Genevieve 3,134 ft.

Jefferson County: Kingwood 1 Welborn, SE SE 13-2s-1e, dry at 2,430 ft., Menard 1,480 ft., Tar Springs 1,597 ft., Glen Dean 1,694 ft., Hardinsburg sand 1,745 ft., Golcondia 1,812 ft., Cypress sand 1,920 ft., Paint Creek sand 2,052 ft., Benoist 2,089 ft., Renault 2,152 ft., Aux Vases sand 2,167 ft., Ste. Genevieve 2,235 ft., Rosiclare 2,264 ft., Fredonia 2,352 ft., McClosky 2,409 ft.

Richland County: Pure 1 Albert Grubb, W½ SW SE 36-3n-8e, pumped 4 bbl. oil and 8 bbl. water, 5,000 gal. acid, reacidized 5,000 gal., McClosky 3,015-18 ft., T.D. 3,025 ft., *pool opener.*

Washington County: R. Hal Compton 1 Hueghy-Hasseimeir, SE SW SE 9-2s-2w, dry at 1,850 ft., Glen Dean 1,150 ft., Barlow 1,307 ft., Cypress sand 1,360 ft., Paint Creek 1,508 ft., Benoist sand 1,597 ft., Renault 1,660 ft., Ste. Genevieve 1,707 ft.

White County: Sun 1 G. Hertlein, S½ SE NW 13-4s-9e, dry, old well deepened from 3,264-95 ft., *formerly completed as East Centerville extension.*

Fields

Coil, Wayne County: Bell Bros. 1 E. M. Stull, SE SE 18-1s-5e, flowed 1,169 bbl. in 21 hr., Aux Vases sand 2,920 ft., T.D. 2,943 ft.

East Centerville, White County: Skelly 7 C. Bryant, SW SE SW 7-4s-10e, pumped 75 bbl., 5,000 gal. acid, McClosky 3,213-20 ft., T.D. 3,223 ft.

Fairfield, Wayne County: H. H. Weinert 1-C Bright, E½ SW NE 2-2s-7e, pumped 240 bbl., perf. 3,266-74 ft., 3,000 gal. acid, reacidized 1,500 gal., McClosky 3,269 ft., T.D. 3,298 ft.

Johnsonville, Wayne County: A. B. Cobb et al 1 C. Lowe, W½ NW SW 3-1s-6e, dry at 3,190 ft., Kincaid 2,044 ft., Menard 2,370 ft., Glen Dean 2,590 ft., Golconda 2,685 ft., Barlow 2,777 ft., Cypress 2,783 ft., Renault 3,022 ft., Aux Vases 3,053 ft., Ste. Genevieve 3,090 ft.

Maunie, White County: H. K. Riddle 1 E. P. Hueble, SW SW SW 7-6s-11e, pumped 58 bbl., 12-qt. shot 1,329-35 ft., saturated sand 1,315-35 ft., T.D. 1,335 ft.

New Bellair, Crawford County: William Kron 2 Ed Wyman, N½ SE SE 19-8n-13w, location abandoned.

New Harmony, White County: Sun 1-B C. Ford, SW SW NE 21-4s-14w, swabbed and flowed 549 bbl., 140-qt. shot 2,833-67 ft., Aux Vases 2,808 ft., T.D. 2,867 ft.

Rural Hill, Hamilton County: Kewanee et al 5-B Cullvar, SE NE SW 14-6s-5e, flowed 100 bbl. in 13 hr., perf. 3,172-88 ft., 2,000 gal. acid, Levias 3,170-86 ft., McClosky 3,248-62 ft., T.D. 3,358 ft.

M. E. Roberts 1 Lockwood, SE SE NE NW 24-6s-5e, pumped 47 bbl., 70-qt. shot 3,121-37 ft., 230-qt. shot 3,120-44 ft., Aux Vases sand 3,121 ft., T.D. 3,145 ft.

Sims, Wayne County: Texas 3 Fuhrer, W½ NW SE 28-1s-6e, pumped 132 bbl., perf. 3,156-64 ft., 2,000 gal. acid, 30-qt. shot 3,013-20 ft., Aux Vases sand 3,010-31 ft., McClosky 3,154-63 ft., T.D. 3,190 ft.

Texas 1 J. Buchal, W½ SW NE 33-1s-6e, pumped 180 bbl., perf. 3,096-3,104 ft., 3,145-51 ft., 3,160-65 ft., 3,000 gal. acid, McClosky 3,144-56 ft., T.D. 3,172 ft.

Walpole, Hamilton County: Sinclair 6 Stelle, NW NE SE 27-5s-6e, pumped 8 bbl., Aux Vases 3,043-56 ft., old well worked over, T.D. 3,061 ft.

Louisiana Gulf Coast Fields

(Continued from Page 76)

dred feet deeper than the discovery pay at 9,800-9,900 ft., and showed favorable indications on an electrical survey.

LOUISIANA GULF COAST COMPLETIONS

Fields

Bayou Sale, St. Mary Parish: Atlantic 3 St. Mary Parish Land Co., 62 bbl., ⅞-in. choke, perf. casing 10,703-30 ft., T.D. 12,404 ft.

Humble 3 Canal Bank & Trust Co., 182 bbl., ⅛-in. choke, perf. casing 10,117-29 ft., T.D. 10,549 ft.

Cameron Meadows, Cameron Parish: Magnolia 38 Cameron Meadows, dry, T.D. 4,774 ft.

Creole, Cameron Parish: Superior 11 State, dry, T.D. 9,007 ft.

Dog Lake, Terrebonne Parish: Texas 14 State, dry, T.D. 9,625 ft.

Grand Bay, Plaquemines Parish: Gulf 18-A Grand Prairie, 357 bbl., 5/32-in. choke. perf. casing 8,148-28 ft., T.D. 8,430 ft.

Lake Salvador, St. Charles Parish: Texas 12 State, 389 bbl., ⅞-in. choke, perf. casing 9,915-20 ft., T.D. 10,250 ft.

Paradis, St. Charles Parish: Texas 27 L. L. and E. Paradis, 498 bbl., ⅞-in. choke. perf. casing 10,390-10,420 ft., T.D. 10,428 ft.

MICHIGAN OPERATIONS

Osceola County Wildcat Comes In at Rate of 500 Bbl.

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Completion of Sun Oil Co. 1 Mary Arndt, wildcat in Section 24, of Osceola Township, Osceola County, for initial natural production gaged at 360 bbl. the first 18½ hours marked an otherwise quiet week in Michigan oil and gas activities. The only other producer completion recorded was in Lincoln Township, Osceola County, where Ohio Oil Co. 3 Hoogerhyde of Section 20 in the Reed City field had initial potential production capacity of 4,320 bbl. a day.

Eight completions of other wildcat tests also developed during the week, all of them being dry holes, including four in Allegan County, one in Clare, another in Ingham, one in Montcalm, and one in Ottawa County. Two natural-gas wells also were on the list.

The state Conservation Department reported 13 drilling permits issued during the week, increasing the 1942 total to 193. Locations include three in Osceola County, two in Mason, one each in Ottawa, Montcalm, Mecosta, Arenac, Bay, Van Buren, Livingston, and Milwaukee.

The department also announced that 40,000 acres of state-owned lands had been leased during the recent state lease rights auction and the state Oil Advisory Board reappointed Harold McLure of Alma and W. P. Clarke of Saginaw to its membership.

A review of proration figures to limit production in some Michigan fields is scheduled before the Advisory Board May 26, it was announced by P. J. Hoffmaster, supervisor of wells, who reported more water has been reported in some fields, the situation being most critical in the Reed City area. Need for proration in Missaukee County and the South Adams deep formation in Arenac County also will be discussed.

MICHIGAN COMPLETIONS

Allegan County, Cheshire Township: W. R. Borough, Inc., 1 Trutsch, C SW NW NE 23-1n-14w, wildcat, dry, T.D. 1,315 ft.

Hopkins Township: Muskegon Development Co. 1 Schwartz, C N½ NE SW 19-3n-12w, wildcat, dry, T.D. 1,579 ft.

Monterey Township: John F. Burton 1 Sebright, SW NW SE 26-3n-13w, wildcat, dry, T.D. 1,952 ft.

Overisel Township: Andrew S. Hoyt, agent, 1 Van Rhee-Van Dam, C NE NW 3-4n-14w, wildcat, dry, T.D. 1,565 ft.

Clare County, Winterfield Township: United Drillers & Producers, Inc., 1 Tyler, C W½ NW NE 29-20n-6w, wildcat, dry, T.D. 3,824 ft.

Ingham County, Ingham Township: Fisher-McCall Oil & Gas, Inc., 1 Rogers, SW SE SW 1-2n-1e, wildcat, dry, T.D. 2,273 ft.

Kent County, Walker Township: Wolverine Natural Gas Corp. 1 Johnson et al, NE NW NW 4-6n-12w, 1,520,000 cu. ft. gas, T.D. 1,075 ft.

Montcalm County, Sidney Township: Chapman Oil Co. 1 Swift-Campbell-Dales, SW NW NE 2-10n-7w wildcat, dry, T.D. 3,330 ft.

Osceola County, Lincoln Township: Ohio Oil Co. 3 Hoogerhyde, C S½ SE NW 20-18n-10w, 4,320 bbl., T.D. 3,602 ft.

Osceola Township: Sun Oil Co. 1 Arndt, C S½ SW SW 24-18n-8w, flowed 360 bbl. in 18½ hr., wildcat, T.D. 3,778 ft.

Taggart Bros. 9 Meyer-Becker, C NW Sec. 22, 3,040,000 cu. ft. gas, T.D. 1,518 ft.

Ottawa County, Polkton Township: Associated Petroleum Co. 1 Irish, NE NW SE 14-8n-14w, wildcat, dry, T.D. 1,909 ft.

SOUTHWEST TEXAS

New Production Found South Of Rincon Field, Starr County

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—A new producing area or a major extension to the Rincon field, Starr County, is indicated by Sun 2-A Frost National Bank, 1½ miles south of the field, which is bottomed at 5,435 ft. An electrical survey was to be made at this point and casing may be cemented for a production test of a sand section at 4,184-87 ft., where a 15-minute drill-stem test recovered 120 ft. of 46.9-gravity oil and 20 ft. of oil-cut mud. Gas sand was logged at 4,509-11½ ft., and the hole may be deepened before setting casing for testing.

In the same county, but located 3 miles north of the Sun field, Sun 1-A Montalvo was being swabbed in attempt to open production from the Vicksburg at 6,090-97 ft., where a recent drill-stem test recovered several hundred feet of pipeline oil. The well was drilled to a total depth of 7,117 ft. and 5½-in. casing was cemented at 6,087 ft. Should the well fail to produce from this section, other sands logged by an electrical survey will be tested. Sun Oil Co. has for the past several months carried on an extensive wildcatting program throughout the country and the results have been very successful.

Four miles northwest of the Barbacoas field, A. T. Espenlawb 1 A. K. Bass, cored shaly sand with an oil odor at 2,104-9 ft., and is now shut down for orders after drill-stem testing failed.

Wildcat Activity

There were 5 wildcat locations announced for the district the past week, making a total of 36 operations either drilling or scheduled to be drilled. Nine of the operations are located in the Laredo district and the balance divided among the Corpus Christi-San Antonio areas. In Duval County, and 2 miles east of the Kreis field, Bridwell Oil Co. is moving in material for 1 A. Reyes in the J. Poitevent Survey, while 6 miles west of the Fitzsimmons field, W. H. McGuffin 1 E. C. Gallagher is a 3,500-ft. test located in the E. Mendez Survey.

In Live Oak County, Brewer & Hixon staked location for a Vicksburg sand test, 1 F. W. Jones in the A.B.&M. Survey, while 4 miles north of Oakville, H. Hotchkins is preparing to spud 2 Wade in the J. Somes Survey. The other location was made in Victoria County, 5 miles southeast of Inez, where Rowan & Hope are preparing to drill 1 C. B. Bladwin in the F. LeLeon Survey.

West of the Sejita townsite, Dan Auld has assembled a block of 1,200 acres centering around Section 53, Copita Farms & Garden tract Addition 3, and is scheduled to drill a 6,500-ft. test.

Earl Baldridge et al are scheduled to drill a number of core tests just south of the Pentias field, Hidalgo County, for the Mexican Government which is reported to have agreed to pay $40,000 for the core tests and if this work is encouraging, the operators will drill a 6,000-ft. test for a consideration of $75,000 to be paid by the Mexican Government. If the well is a producer an additional $35,000 will be paid as bonus money. The Pentias field was opened several months ago by the Arkansas Fuel Oil Co., but no additional wells have been drilled on the structure which is located just north of the Rio Grande.

W. E. Masterson of Corpus Christi, Tex., has completed a drilling block 5 miles south of Robstown, Nueces County, and tentative location for a 7,000-ft. test was made in Section 6, George H. Pauls subdivision of Driscoll ranch. Continental Oil Co., Pure Oil Co., and Fred W. Shields purchased "spreads" around the well while several other companies have donated acreage.

Bruce Baxter, who opened the Lenandro field, Jim Wells County, has sold all his acreage totaling approximately 1,150 acres around the discovery well to Murchison & Closuit, Inc., for a consideration of $4,000 cash and retained $50 per acre oil payment to be paid from one-eighth of seven-eighths of the royalty and an additional one-eighth royalty interest. Murchison & Closuit have agreed to start a well within 30 days, a second well within 4 months and a third test within 8 months. The discovery well of the field was drilled to a total depth of 6,008 ft., and was completed in the Frio sand at 4,115-22 ft.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST

Wildcats

Bee County: Tide Water 1 Imogene Hall, Cockfield 3,888 ft., Discorbis Yeguaensis 4,137, Eponides Yeguaensis 4,167 ft., dry, T.D. 7,881 ft.

Nueces County: Phillips 1 Molina, dry, T.D. 5,500 ft.

Willacy County: Baldridge & King 1 Berndt, dry, T.D. 8,010 ft.

Fields

Agua Dulce, Nueces County: Republic Natural Gas Co. 1 Pfluger, 136 bbl., 7/64-in. choke, perf. casing 7,077-80 ft., T.D. 7,107 ft.

South Caesar, Bee County: Luling 1 Tom Slick, 107 bbl., ⅛-in. choke, perf. casing 6,642-46 ft., T.D. 6,673 ft.

Jay Simmons 1 Cotton, dry, T.D. 6,634 ft.

Wade City, Jim Wells County: W. R. Quinn 1 Schrade, 192 bbl., ⅛-in. choke, perf. casing 4,905-11 ft., T.D. 4,911 ft.

LAREDO DISTRICT

Wildcats

Duval County: Guy Warren 2 Driscoll, dry, T.D. 3,983 ft.

Magnolia 1 Duval County Ranch Co., dry, T.D. 4,305 ft.

Texas 1 Timon, dry, T.D. 2,707 ft.

Starr County: Sun 1 Garcia, dry, T.D. 4,505 ft.

Fields

Colorado, Jim Hogg County: Humble 64-B King, 154 bbl., ⅛-in. choke, T.D. 3,010 ft.

Humble 67-B King, 80 bbl., ⅛-in. choke, T.D. 3,134 ft.

Sun 3-B East, 8 bbl. pumping, T.D. 2,833 ft.

Sun 4-B East, 33 bbl., 9 hr., ⅛-in. choke, sand 2,957-77 ft., T.D. 2,977 ft.

North Sun, Starr County: Sun 2 Garza, dry, T.D. 4,485 ft.

Rincon, Starr County: Continental 66-B Slick, 228 bbl., ⅛-in. choke, perf. casing 4,101-22 ft., T.D. 4,155 ft.

Washburn, La Salle County: Quintana 11 South Texas Syndicate, 194 bbl., ¼-in. choke, top sand 5,560 ft., T.D. 5,571 ft.

APPALACHIAN FIELDS

Deep Exploration Slows as Successes Are Few

PITTSBURGH, Pa.—In the lower eastern fields, exploration of the deep sands (Lower Devonian) still continues but with a minimum of success. In West Virginia, several wells are drilling at the present time with additional locations to be reported in the near future. In Pennsylvania, several are drilling but only one is at a critical depth now. In the Elk-Poca field in Kanawha County, West Virginia, another fair oil well was completed.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Bethel Township: Local Co. 1 Samuel Mansfield, 84,000 cu. ft. gas, Fifth sand 2,059-95 ft., gas 2,063 ft., Tiona 3,030-32 ft., gas 3,031 ft., T.D. 3,132 ft.

Clarion County, Limestone Township: T. Swartsfager et al 4 B. J. Reinsel, 89,000 cu. ft. gas, Hundred-foot, Warren, and Tiona sands, T.D. 2,798 ft.

Greene County, Center Township: Manufacturers Light & Heat Co. 1 C. W. Orndoff, 735,000 cu. ft. gas, Nineveh Thirty-foot sand 2,998-3,033 ft., gas 3,015-20 ft., T.D. 3,034 ft.

Morris Township: Manufacturers Light & Heat Co. 1 Lee McCullough, dry, through Bayard and Elizabeth sands, T.D. 3,634 ft.

Washington County, Amwell Township: William Bungard et al 1 Lucille Frazee, drilled deeper, first Salt sand 1,596-1,617 ft., dry, P.B. and tests from original pay, 47,000 cu. ft. gas, T.D. 1,617 ft.

Hanover Township: John Johnson et al 1 S. S. Dunbar, dry, T.D. 2,170 ft.

Hopewell Township: Morris et al 1 J. B. Smith, dry, through Fifth sand, T.D. 2,718 ft.

WEST VIRGINIA

In Meade district, Tyler County, the test of Benedum & Trees on the Pearl Broadwater farm is drilling at 5,870 ft. in shale and with the formation appearing lighter than the Hamilton which it should now have reached. It appears to be running regionally low.

In Poca district, Kanawha County, Virginian Gasoline & Oil Corp. completed 3 (V1,320) J. A. Wines in the Big lime and it is showing for 100 bbl. a day and 100,000 cu. ft. of gas. The Big lime was topped at 1,567 ft.; gas 1,651 ft.; oil 1,674 ft.; total depth 1,687 ft.

WEST VIRGINIA COMPLETIONS

Calhoun County, Sherman district: Jackson River Oil Co. 3 Yoak and McDonald, 40 bbl., Injun sand, T.D. 2,239 ft.

South Penn Natural Gas Co. 9 J. S. Sharp, 4 bbl., Injun sand, T.D. 2,085 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co. 7795 Elk River Coal & Lumber Co., drilled deeper, dry, started 2,209 ft., Big Injun 2,185-2,339 ft., T.D. 2,343 ft.

Logan County, Logan district: O. B. Cunningham 1 Workman, Mullins & Spratt, 35,000 cu. ft. gas, Big lime 1,603-1,810 ft., Injun 1,810-50 ft., Berea 2,367-83 ft., T.D. 2,433 ft.

Mingo County, Warfield district: McKinley Trent, Tr., 6 Noah A. Stepp, 50,000 cu. ft. gas, Big lime 2,059-2,254 ft., Injun 2,270-98 ft., Berea 2,854-2,910 ft., T.D. 3,056 ft.

Putnam County, Curry district: Easter Gas Co. 1 T. C. Easter, 84,000 cu. ft. gas after shot, Big lime 1,615-1,787 ft., Injun 1,815-55 ft., Berea 2,294-2,319 ft., T.D. 2,340 ft.

Buff Creek Gas Co. 1 A. M. Pullens, drilled deeper, 103,000 cu. ft. gas, start 1,737 ft., Big lime 1,656-1,772 ft., Injun 1,805-82 ft., Berea 2,301-26 ft., shot 2,301-30 ft., R.P. 460 lb. 48 hr., T.D. 2,343 ft.

Ritchie County, Grant district: E. C. Hartman 2 A. F. Parks, dry, through Squaw, Big lime 1,585-1,680 ft., Maxton 1,543-85 ft., T.D. 2,180 ft.

Upshur County, Banks district: Hanley & Bird 1 Lon Ogden, small gas well, Benson sand 4,170-4,208 ft., gas 4,179-4,200 ft., T.D. 4,417 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: United Fuel Gas Co. 5075 Kenna G. Parsons, 4,414,000 cu. ft. gas, Big lime 1,777-1,917 ft., Injun 1,917-80 ft., Berea 2,338-50 ft., Corniferous 4,883-5,003 ft., Oriskany 5,003 ft., gas 5,011 ft., R.P. 1,740 lb., T.D. 5,012 ft.

Ripley district: United Carbon Co. 1018 Elizabeth W. Perkins, 8,260,000 cu. ft. gas, Corniferous 5,001 ft., Oriskany 5,110 ft., shot 5,115-42 ft., R.P. 1,690 lb., T.D. 5,152 ft.

Development of Nation's Highest Field Continues

By T. R. INGRAM

DENVER, Colo.—The Continental Oil Co. completed its fifth well the past week on the Circle Ridge dome in Fremont County, Wyoming, 6 miles northwest of the Maverick Springs field, in its drilling program to determine the possibilities of the Tensleep horizon. It is a small dome with sharply dipping flanks and 2,000 ft. of closure. The Union Oil Co. of California drilled a well 19 years ago which made 132 bbl. in 24 hours from the Tensleep at 592-655 ft. The field then was shut in until last fall when the Continental began its exploratory campaign. The first well was E½ SE NE 1-6n-3w. It had the Tensleep at 395-660 ft., and pumped 191 bbl. in 24 hours, that being the capacity of the pump, after casing off 216 bbl. a day in the Embar. The next well was 660 ft. to the west. It was abandoned at 635 ft. in the top of the red beds, finding the formations tilted almost on end. It then went 1,650 ft. to the south of the first well and drilled the third well which bailed 30 bbl. per day natural at 655 ft. No pumping test was made. The next well midway between the first and third wells and 660 ft. east of a straight line between them, bailed 77 bbl. a day. The fifth well, a completion the past week, was 660 ft. to the north of the first well and bailed at the rate of 192 bbl. a day at 690 ft. The limits have been defined only on the west side. The wells were shut in after bailing tests. The elevation is approximately 7,100 ft. above sea level. The field is 20 miles to the northwest of the discovery 2 weeks ago on Pilot Butte in the Superior-British American 1 Tribal. This well found the Tensleep approximately 670 ft. below sea level. The difference in elevation on the Tensleep in 20 miles, in round figures is about 7,400 ft.

High Initial Recorded in Kevin-Sunburst Well

Coolidge & Coolidge 4 Waite in the Kevin-Sunburst field, in an area where 5 and 10-bbl. wells predominate, proved a surprise. It found gas in the contact and the tools were pushed 150 ft. up the hole. It then flowed until the head was off when it settled to 1,200 ft. and swabbed 100 bbl. naturally in 12 hours. It will be acidized with 1,000 gal., and if it responds to treatment like other wells in the field, it will be a big producer.

To Seek Extension of Cut Bank Shore Line

The Texas Co. released the location for its test in the Dupuyer area in Pondera County, Montana, this week in its 1 Kingsbury, C SE SE 8-29n-7w, north of the town of the same name. This will be the first of several wells on a block of 68,000 acres which have for their objective the possible discovery of the extension of the shoreline from which Cut Bank is producing and is not a structural test in the sense that term is used. The company drilled several wells a few years ago in the Valier district seeking a southeast extension of Cut Bank without results. It then undertook extensive research to the southwest with the same objective in view. In the meantime, the gradual extension of the productive area in the southern part of the Cut Bank field indicated that the shoreline might extend in the direction of the area to be explored. Manning & Martin, Inc., have the contract.

The Van Etta Oil Co., a State of Washington corporation, is the concern which has taken over the old Joan Oil Co. 1 Howell in 32-56n-97w, Big Horn County, Wyoming, and will complete it to the Tensleep with rotary tools. Equipment is being moved in. The well is on the southwest flank of the Garland dome and if productive would mean an important extension of that field.

Unofficial reports received in Denver through reliable sources say that Kirk Oil Co. 1 Unit 4, NW NW SE 29-51n-100w, Oregon Basin field, came in flowing around 4,000 bbl. a day from the Embar-Tensleep horizon. None of the details are available, but circumstances tend to confirm the report. Unit 4 comprises the SE Section 29 on the northeast side of the south dome. The Kirk company purchased the lease from the Government last January on a high bid of $610 an acre. It was classed as proven territory as it lies between producers on the east and north and the top of the structure. It is nearer the apex than any oil well drilled north of the major fault which traverses the dome from northeast to

(Continued on Page 88)

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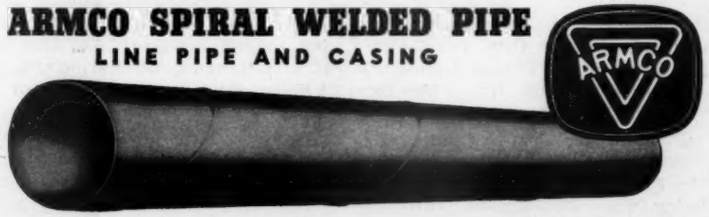


NORTH CENTRAL TEXAS

Simpson Sand Production Found in Montague County

By ROBERT INGRAM

WICHITA FALLS, Tex.—Simpson sand production was opened in southwestern Montague County last week and a new Viola lime pool was in prospect. Both of these Ordovician horizons are highly productive throughout Oklahoma, which borders the county to the north, particularly on the north flank of the Arbuckle Mountains. However, the Simpson strike was the first for the Fort Worth basin. It was also the deepest production in the basin to date.

Discovery in the Simpson was made by Continental Oil Co. 1 Mueller, P. Hamilton Survey, 4 miles east of Bowie. The well flowed 649 bbl. of oil, including a 270-bbl. oil load, during an unannounced period of time. During the last 7 hours of the flowing test, it made 115 bbl. of oil with no water through 1-in. choke on 2-in. tubing. Casing pressure gaged 100 lb. and tubing pressure 75 lb. Gas was estimated at 1,000,000 cu. ft., and oil tested 45.8 gravity.

Top of the Simpson sand was 7,135 ft. (compared with Wilcox at 3,885 ft. at Pauls Valley, Oklahoma, and McLish at 5,900 ft. at Cumberland, Oklahoma). Best pay was below 7,200 ft. where 5½-in. liner was cemented. Total depth was 7,223 ft.

Viola lime production was showing at Continental 1 Penn, A. E. Topper Survey, southeast offset to the discovery well in the Turner conglomerate pool 6 miles north of Bowie. The Viola (Upper Ordovician) was found at 6,692-6,747 ft., total depth, and was treated with 7,000 gal. of acid for further testing after it swabbed 228 bbl. of oil and 30 bbl. of fresh water in 24 hours natural, and 323 bbl. of oil and 11 bbl. of acid water in 35 hours after being washed with 1,000 gal.

For many years it was believed the Viola lime did not exist in North Texas and it was not until deep exploration was undertaken in recent months in the Montague portion of the Fort Worth basin that presence of the section was established.

Marble Falls Also May Pay Off

A third deep zone for the basin and the first Marble Falls (basal Pennsylvanian) production for Montague County was showing at Sinclair Prairie Oil Co. 1 Jones, I. Singletary Survey, 1 mile east of Forrestburg. At last report, this well was swabbing at 7,316 ft., with plugged-back depth at 7,320 ft., and was getting 3 bbl. of oil an hour. Oil tested 36.3 gravity.

Seven-inch casing was cemented at 7,176 ft., and the test had been carried to 8,696 ft. in the Ellenburger (Lower Ordovician).

Stoneburg Area Disappoints

Continental Oil Co. 1 J. F. Yowell, Section 8, Limestone C.S.L. Survey, 1½ miles northeast of Stoneburg, Montague County, was abandoned at 7,224 ft. Two adjoining tests, Continental 1 Orth Yowell and Continental 1-S Orth Yowell, were abandoned at the same time without drilling anywhere near the prospective pay zones. (See completions.)

All the tests were started after Continental 1 Winder, Section 4, came in last December from a lime in the Bend series at 6,233-41 ft. and had a good showing in the Mississippian. Three rigs were moved on the Yowell locations on the strength of the Winder showing.

Sewell Field Extended

Henry Zweifel of Fort Worth, Tex., completed a 3-mile outpost to the Sewell field from Caddo lime at 3,947-56 ft. for 139 bbl. of light green oil. (See completions.) The well is only 1 mile from shallow production in the Cox field, but is considered an extension to the Sewell field which was opened in 1938 by Cosden Petroleum 1-B D. R. Sewell, 5 miles southeast of Graham and has since been developed by drilling 34 wells.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: Sinclair Prairie 1 H. C. Sloop, 330 ft. from S and E lines of NW Sec. 8, H.&T.C. Sur. Blk. 1, A-1,218, 9 mi. N of Scotland, dry, shows at 4,652-4,750 ft., T.D. 5,491 ft.

Clay County: E. P. Bowen 1 Fort McHam, 330 ft. from N and W lines of 82.4-acre farm in Sec. 39, Specht-McCutchen subd., 3 mi. W of Thornberry, location abandoned.

Montague County: Continental 1 J. F. Yowell, 990 ft. from S line and 660 ft. from E line of N½ of Sec. 8, Limestone C.S.L. Sur., 1½ mi. NE of Stoneburg, dry, Caddo 5,986 ft., Viola 6,386 ft., Ellenburger 7,000 ft., D.S. test 7,156-7,224 ft., recovered salt water, T.D. 7,224 ft.

Stanolind 1 Mrs. Rosie Germany, Sec. 5, Lot 89, Charles Lockhart Sur., 3½ mi. SW of Belcherville, dry, Caddo 5,586 ft., Simpson 5,861 ft., Ellenburger 6,167 ft., D.S. test 5,633-98 ft., recovered drilling fluid, T.D. 6,217 ft.

Young County: Henry Zweifel 1 W. E. Steele, 660 ft. from N and W lines of J. C. Van Hooser Sur., A-1,648, 8 mi. SE of Graham, flowed 139 bbl. oil and 12,000,000 cu. ft. gas in 20 hr., Caddo lime, perf. 3,947-56 ft., acid, T.D. 4,412 ft., *3-mi. southeast extension to Sewell field.*

Fields

Bulcher, Cooke County: Kewanee Oil & Gas 19 F. C. Hyman-Lanier-A, 50 ft. N of No. 8 in E.T.R.R. Sur., A-363, old well, sand 1,869 ft., T.D. 1,895 ft., completed as water-disposal well.

Herron City, Young County: Mid-Continent 1 H. Owens, 660 ft. from S and E lines of J. E. Dowdle Sur., A-2,215, pumped 60 bbl. in 24 hr., perf. 4,012-23 ft., T.D. 4,740 ft.

K.M.A.-Ellenburger, Wichita County: Tide Water 3-E Mrs. Anna Mangold, 2,361 ft. from S line and 3,610 ft. from E line, Lot 38, but in Lot 39, P. Castleman Sur., A-35, flowed 1,208 bbl., Ellenburger 4,254 ft., dolomite pay 4,257-4,324 ft., acid, T.D. 4,324 ft.

Ringgold, Montague County: W. B. Omohundro 4 Wilmer Seay, 467 ft. from N line and 1,650 ft. from W line, Sec. 32, H.&T.C. Sur., Blk. 4, A-1,312, location abandoned.

Ross, Clay County: Continental, Superior, and Dillard 3 O. O. Ross, Jr.-A, 1,417 ft. from N line and 440 ft. from E line of Sec. 8, B.B.B.&C. Sur., A-902, flowed 1,050 bbl., perf. in lime 5,424-95 ft., acid, T.D. 5,510 ft.

Thornberry, Clay County: W. H. Spradling 2 J. P. Sunday, 330 ft. from S line and 800 ft. from E line of A. McGowan Sur., A-519, dry, T.D. 1,156 ft.

Walnut Bend, Cooke County: Sinclair Prairie 9 N. Atkins, 115 ft. from N line and 2,311 ft. from S line, Lot 59, Fannin C.S.L. Sur., potential 476 bbl., sand 4,930-36 ft., T.D. 4,936 ft.

Miscellaneous

Montague County: Continental 1 Orth Yowell, Sec. 8, Limestone C.S.L. Sur., A-421, 1 mi. E of Stoneburg, location abandoned.

Continental 1-S Orth Yowell, Sec. 8, Limestone C.S.L. Sur., A-421, 1 mi. E of Stoneburg, dry, T.D. 1,232 ft.

New Caddo Lime Pool Indicated For Callahan County

FORT WORTH, Tex.—A new Caddo lime pool was indicated at Don Dansby 1 W. A. Ramsey, Block 2277, T.E.&L. Survey, 3½ miles northeast of Putnam in Callahan County. The well topped the Caddo at 3,206 ft. and found saturated lime at 3,222 ft. It drilled 1 ft. into the lime, then casing was run and cemented at 3,220 ft. Testing was scheduled early in the week.

It is in the general area of the old Baird-Pueblo field which has been producing from shallow zones (above 620 ft.) since 1921 and was opened to Canyon production in 1926. The well, if successful, will open the county's first deep pool for the year.

(Continued on Page 84)

EASTERN TEXAS

Second Concord Test Yields Water in Woodbine Sand

By ROBERT INGRAM

DALLAS, Tex.—Magnolia Petroleum Co.'s second attempt to get pay in the new Concord pool of Anderson apparently had ended in failure last week as the 1 Joel Kelley, McNelly Survey, showed water on a drill-stem test in Woodbine sand at 4,562-79 ft. The well was 1,500 ft. southwest of the 1 Campbell discovery, and ran some 76 ft. low to the discovery on the Woodbine although it had been high on the base of the Austin chalk, topped at 4,190 ft.

Woodbine sand was topped at 4,548 ft. on core analysis, and at 4,550 ft. by electrical log. Most of the structural position was lost in the Eagleford shale which was more than 192 ft. thick compared with only 163 ft. in the 1 Campbell. Some oil shows were returned in cores from 4,559 to 4,579 ft., but on the 30-minute drill-stem test, the well recovered 1,740 ft. of mud and 1,170 ft. of salt water. General opinion was that the 1 Kelley either was on the edge of the structure or the structure was spotty.

Operators resumed coring, however, and it was considered likely the hole would be carried to the Georgetown lime. At the same time leasing continued as P. G. Lake of Tyler took the south 100 acres of the 213-acre Beasley trace in the Thomas Moore Survey, more than a mile north of the discovery, and also the south 60 acres of the M. R. Henderson tract in the Elizabeth Groce Survey, south of the 1 Campbell.

Drilling Progress

The Chapel Hill pool of eastern Smith County, producing oil and gas-distillate from the Paluxy sand at below 8,000 ft., continued one of the most active areas in the district with rigs running for Sun Oil Co., Magnolia Petroleum Co., Shell Oil Co., Inc., and Sinclair Prairie Oil Co. . . . Amerada Petroleum Corp. 1 Kennemer, Knight Survey in Wood County, was drilling ahead at 4,650 ft. with information being withheld. . . . Word spread at week's end that coring continued below 5,800 ft. at the Texas Co. 1 Keeling, Limestone County wildcat in the Whitaker Survey, giving rise to the belief that the objective was near. The test is key in the current Smackover lime play along the fault zone.

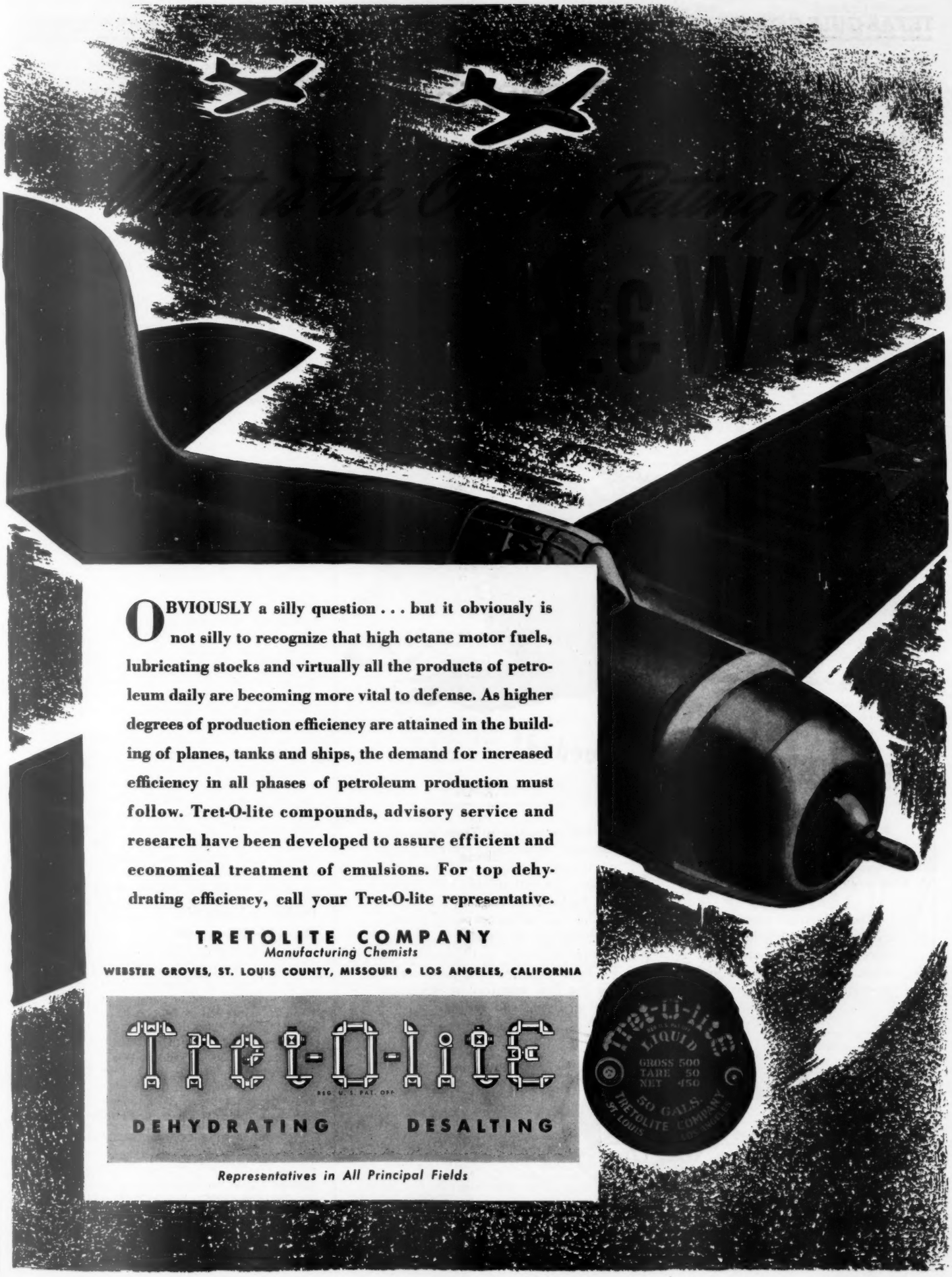
EAST TEXAS COMPLETIONS

Fields

Pleasant Grove, Rusk County: L. O. McMillian 1 W. T. Gason, George May Sur., dry, Pecan Gap 3,112 ft., Austin chalk 3,918 ft., Woodbine 4,069 ft., T.D. 4,109 ft.

Hawkins, Wood County: Humble 4 A. T. Clift, J. Pollock Sur., potential 163.65 bbl. through ¼-in. choke, Pecan Gap 3,162 ft., Austin chalk 4,231 ft., Woodbine 4,626 ft., T.D. 4,887 ft.

Humble 3 Ellis Prince, G. Brewer Sur., potential 102.82 bbl. in 6 hr. through ¼-in. choke, perf. 4,602-09 ft., 4,802-08 ft. and 4,845-51 ft., Pecan Gap 3,025 ft., Austin chalk 4,043 ft., Woodbine 4,404 ft., T.D. 4,861 ft.



OBVIOUSLY a silly question . . . but it obviously is not silly to recognize that high octane motor fuels, lubricating stocks and virtually all the products of petroleum daily are becoming more vital to defense. As higher degrees of production efficiency are attained in the building of planes, tanks and ships, the demand for increased efficiency in all phases of petroleum production must follow. Tret-O-lite compounds, advisory service and research have been developed to assure efficient and economical treatment of emulsions. For top dehydrating efficiency, call your Tret-O-lite representative.

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DEHYDRATING DESALTING

Representatives in All Principal Fields

Shallow Wilcox Section Shows Oil in Fayette County

By F. L. SINGLETON

HOUSTON, Tex.—Operators in the Texas Gulf Coast district were watching the outcome of a scheduled production test of Continental 1 Fannie Gabitzsch, a wildcat located in the Cistern area, northwestern Fayette County. The well was drilled to a total depth of 4,340 ft., and 6-in. casing was cemented at approximately 2,900 ft., preparatory to testing several sand sections in the Wilcox at intervals from 1,700 to 2,870 ft., where side-wall cores are reported to have recovered sand with an oil odor. The top of the Wilcox was reported at 1,650 ft. The completion of the well as a commercial producer would open the first production for the county and enhance exploration along the updip sector of the Wilcox trend. Location of the well is in the J. T. Whiteside Survey.

In the meantime, Shell Oil Co., Inc., 1 Hinze, located in the Sealy area, Austin County, was still in the process of testing the Wilcox section, but details were not available. Total depth of the well is below 11,000 ft., and drill-stem testing in the lower section is reported to have tested gas-distillate and salt water. Other showings logged up the hole are now being tested.

Wilcox to Be Tested In Livingston Field

Wilcox development was extended to another proven field as Jordan Drilling Co. prepared to spud 1 I. B. Munson, located in the Livingston field, Polk County. This will be first Wilcox test to be drilled on the structure, although such development has been anticipated for several years in view of the success of such operation in other Cockfield sand fields.

In Matagorda County, and located 1 mile north of Orchard City, Pure 1 L. LeTulle, E. Yeamans Survey, was flowing wash water and gas through a ⅛-in. choke while testing through perforated casing at 4,210-25 ft. Tubing pressure was 1,500 lb. Total depth of the well is 4,468 ft., and 6-in. casing was cemented at 4,297 ft. The well is situated in what is known as the Citrus Grove area, being located between two gas wells drilled by McDannald Oil Co. The general area has been looked upon as a favorable prospect for a number of years, but a thick section of heaving shale has retarded exploration.

In the same county and located on the Shepherds Mott area, Continental Oil Co. staked location for 3 H. B. Hawkins on the east flank in the J. W. Byrne Survey. This is another favorable prospect in which development has been limited due to heaving shale.

Production in the Stowell field, Jefferson County, was extended with the completion of Glenn McCarthy 1 Stewart-Sullivan, which flowed at the rate of 419 bbl. daily through a $\frac{3}{16}$-in. choke. The Frio sand was topped at 9,024 ft. and was cored to a total depth of 9,127 ft.

Locations for three interesting wildcats were announced. In Brazoria County, Humble Oil & Refining Co. is making preparations to drill two tests, one being located on the Rattlesnake Mound prospect, 2 Houston Farm Development Co. in the W. Lyles Survey, and the other in the Halls Bayou area, Section 2. Both of these prospects have been worked extensively with geophysical instruments. In Liberty County, and located 12 miles west of Liberty, W. F. Bowman staked location for 1 Louis Lobity, a projected 8,000-ft. test located in the Samuel Netherly Survey.

Producing Limits of Mayo Field Expanded

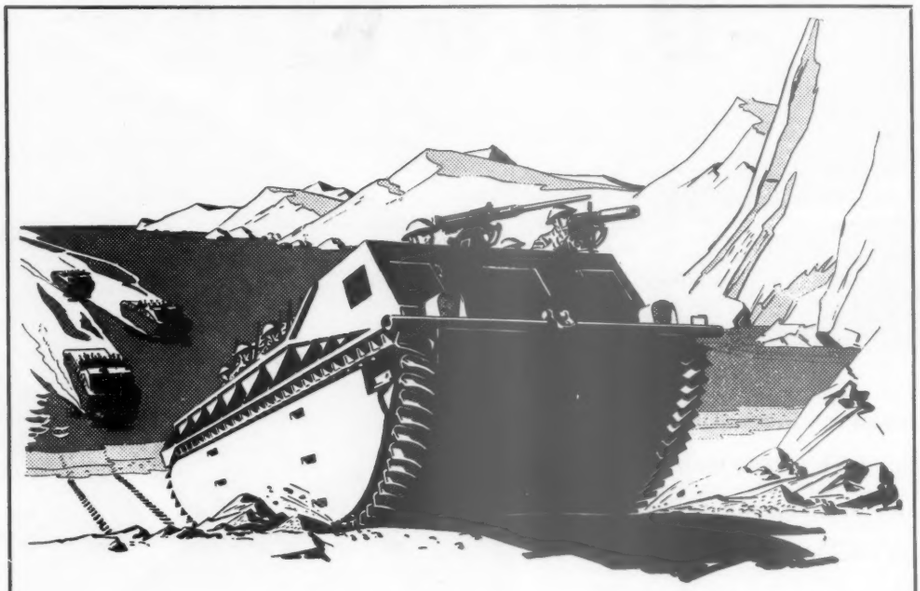
The producing limits of the Mayo field, Jackson County, was being expanded as one well was completed and two others were in the process of completion. The completion was Boyle-Mayo 1 Stroubal, completed at 5,404-40 ft., flowing at the rate of 15 bbl. daily through a ⅛-in. choke. The same operators' 1 Hafner tested oil and salt water in the 5,500-ft. sand and has plugged preparatory to completing in sand at 5,412-17 ft., where a drill-stem test recovered pipe-line oil. Louis Courch 1 Stoner is bottomed at 5,630 ft., and 5½-in. casing was cemented at 5,550 ft.

TEXAS GULF COAST COMPLETIONS

Fields

Alta Loma, Galveston County: Stanolind 1 John A. Hulen, 511 bbl., ¼-in. choke, T.D. 9,185 ft.
Big Hill, Jefferson County: Stanolind 1 Davidson, top salt 10,090 ft., dry, T.D. 10,114 ft.
Lovells Lake, Jefferson County: Humble 37 Broussard, 125 bbl., ⅛-in. choke, sand 7,789-94 ft.
Humble 39 Broussard, 81 bbl., ⅛-in. choke, sand 7,787-96 ft.
North LaWard, Jackson County: Magnolia 20 Gordon,

(Continued on Page 88)



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Second Wilcox Produces in St. Louis Pool Deep Test

By CARL HOOT

WHAT may prove to be an important "discovery" in an old area that dates back to 1927 was completed in the northern section of the St. Louis district, Pottawatomie County. Magnolia Petroleum Co. 3 Nona, NE NW 11-7-4, pumped 194 bbl. a day from the second Wilcox at 4,262-70 ft. Producing zones in this immediate area has been predominantly Hunton and Simpson dolomite, with Wilcox wells farther north and east. Both the Hunton at 3,708 ft. and dolomite at 4,120 ft. in the 3 Nona were dry. The first reported producing well in Section 11 was Magnolia 1 Joseph Nona, about ⅛ mile south, which flowed 1,200 bbl. a day from Hunton at 3,816-43 ft. A mile southwest of 3 Nona, Sinclair Prairie 1 M-Qua-Ka had pay in the Hunton at 3,836-65 ft. The well was later deepened and found the first Wilcox dry at 4,194 ft. and water in the second Wilcox at 4,201-14 ft. After plugging back to the Simpson dolomite at 4,098 ft. the well continued to pump 100 bbl. of oil a day. A majority of the wells in Section 11 which originally found production in the Hunton or Simpson formations at depths from 3,771 ft. to 4,040 ft., respectively, were deepened to the first Wilcox but were plugged back when water intruded. In 1935 Sinclair Prairie 2 M-Qua-Ka, ½ mile south and west of the 3 Nona, found Viola at 4,146 ft., Simpson dolomite from 4,205-92 ft. with no shows in either zone and was plugged back to 3,903 ft. where it made a small producer from the Hunton.

Hunton Production Found In Tecumseh Pool

Another prolific Hunton lime producer was added to the Tecumseh area with the completion of Continental Oil Co. 1 Baker, SW SE SE 33-9-3, Pottawatomie County. The well flowed 458 bbl. of oil through ½-in. choke with 1,500,000 cu. ft. of gas from Hunton at 4,817-56 ft. On drill-stem test at 4,818-56 ft. opened 30 minutes, gas started to flow in 9 minutes and 4,200 ft. of oil was recovered. Site of the well is one 40-acre location north of Cities Service and Atlantic 1-A Fort Cobb recently completed for 773 bbl. in 15 hours from Hunton found at 5,186 ft.

Possibility of linking the two wells with the Tecumseh one-well pool was evident as the log of Stanolind 1-B Billington showed oil in the Hunton from 4,795-5,000 ft. Tecumseh's lone producer is an outstanding well. Completed in July 1937 for initial production of 1,400 bbl. a day from Simpson dolomite at 5,165-5,238 ft., plugged-back depth, the well has produced over 150,000 bbl. to date. One-half mile northeast of the 1-B Billington, Herman Hurst 1 Womack, SW SW NE 32-9-3, was completed dry last week at total depth of 5,360 ft. Hunton lime at 4,955 ft. was dry and there was water with a show of oil in dolomite at 5,200 ft. This is the only other well recorded for Section 32.

The Byars pool of McClain County, located along the eastern edge of Sections 9 and 16-5n-3e, was extended one 40-acre location south by Phillips Petroleum Co. 1 McAfee, SE NE 21-5-3. Production was 70 bbl. from Viola at 3,582 ft. Patsy Oil Co. 7 Caldwell, W½ NW NW 22-5-3, was dry at 3,614 ft. Location is northeast of the Phillips well and is on a line directly north and south with several other dry holes which bound the field on the west line of Section 10 and 15. Production for the entire field is from Viola lime found from 3,480 to 3,605 ft. Initial production has been reported from 30 to 2,000 bbl. Four 10-acre offsets to the 2,000-bbl. well, completed in 1940 by Patsy Oil & Gas Co., were dry to the north, northeast, southeast, and south.

OKLAHOMA COMPLETIONS

Wildcats

Jefferson County: Gulf 1 Greiser, NE NE 28-7s-7w, dry, T.D. 5,775 ft., Cisco 2,100 ft., Canyon 2,500 ft., Strawn 4,870 ft., Arbuckle 5,575 ft.

Spring area: Benson-Benson 1-A Seay, SW NW SE 29-6s-5w, dry, T.D. 1,926 ft., show oil in sand 1,883-86 ft.

Kay County: W. M. McKnabb 1 Williams, E½ SE SW 27-28-2w, dry, T.D. 4,694 ft., Mayes 4,127 ft., Woodford 4,470 ft., Misener 4,538 ft., dolomite 4,541 ft., Wilcox 4,561 ft., second Wilcox 4,644 ft.

Oklahoma County, 7 mi. NE of Edmond: Harper-Turner 4 Harper, NW NW SE 17-14-2w, flowed 40 bbl., sand 5,822-50 ft.

Pottawatomie County: Continental 1 Baker, SW SE SE 33-9-3, flowed 458 bbl., Hunton 4,817-56 ft.

Fields

Byars, McClain County: Phillips 1 McAfee, SE NE 21-5-3, flowed 70 bbl., Viola 3,582-97 ft.

Patsy Oil 7 Caldwell, W½ NW NW 22-5-3, dry, T.D. 3,614 ft.

Cox, Carter County: J. H. Harrell 1 Cox, NE NE SW 22-2s-2w, pumped 10 bbl., sand 1,013-1,190 ft., T.D. 1,245 ft.

Earlsboro, Seminole County: Jordan Pet. 1 Hood, SE NW 35-10-5, pumped 180 bbl., dolomite 4,198-4,210 ft., T.D. 4,240 ft.

Hobart, Kiowa County: H. J. Sherman 1-C Watkins, NE SW 18-7-17w, dry, T.D. 2,182 ft.

Hotulke, Pottawatomie County: Phillips 21 Billington, SE NE 25-9-4, flowed 243 bbl. through choke, Hunton 4,095-4,104 ft., T.D. 4,352 ft.

Atlantic 2 Nisbett, NW cor. 27-9-4, pumped 485 bbl., Viola 4,465-95 ft., T.D. 4,609 ft.

St. Louis, Pottawatomie County: Magnolia 3 Nona, NE NW 11-7-4, pumped 194 bbl., second Wilcox 4,262-70 ft.

Tecumseh, Pottawatomie County: Herman Hurst 1 Womack, SW SW NE 32-9-3, dry, T.D. 5,360 ft., Mayes 4,760 ft., Woodford 4,810 ft., Misener 4,950 ft., Hunton 4,955 ft., Viola 5,110 ft., dolomite 5,200 ft.

Tonkawa, Noble County: Ingling & Parker 2 Blubaugh, SE NW 1-24-1w, dry, T.D. 3,318 ft.

Velma, Stephens County: Skelly 20 McClanahan, NE SW SW 35-1s-5w, pumped 10 bbl., sand 682 ft., T.D. 730 ft.

Magnolia 1 Carpenter, SE NE SW 36-1s-5w, dry, T.D. 910 ft.

Miscellaneous

Creek County: Midco 1-A Tiger, NE NE NW 24-16-10, dry, T.D. 2,100 ft.

Sinclair Prairie 15 Gooden, NE NW SE 16-17-7, pumped 18 bbl., Bartlesville 2,765-2,805 ft., T.D. 2,808 ft.

Gulf 32 Jackson, C E½ SW 16-17-12, pumped 8 bbl., Glenn 1,470-1,595 ft., T.D. 1,603 ft.

Osage County: Sinclair Prairie 58, NW SW NW 20-23-12, pumped 22 bbl., Bartlesville 1,708-39 ft., T.D. 1,760 ft.

A. G. Oliphant 3, NW NW NE 6-24-11, pumped 25 bbl., Bartlesville 1,685-1,755 ft., T.D. 1,780 ft.

Tulsa County: E. E. Morey 7 Lewis, NE NE 21-19-12, 1,500,000 cu. ft. gas. sand 1,440-43 ft.

Recompletions

Creek County: Gulf 27 Berryhill, S½ NW NE 17-17-12, pumped 3½ bbl., T.D. 1,588 ft., old T.D. 1,544 ft.

Pottawatomie County: Phillips 1 Luttrell, NW NE NW 1-9-3, flowed 5 bbl., 5,210 ft., T.D. 5,265 ft., P.B. 5,258 ft.

Seminole County: Ligon et al 1 Wilson, NW NW NE 30-8-8, dry, T.D. 4,142 ft., P.B. 3,330 ft.

Hughes County, wildcat: Byers Drlg. 1 Bond, NE NE NW 7-7-9, dry, T.D. 3,098 ft. in Gilcrease.

Kay County: Ingling & Parker 3 School land, SE SW NE 36-25-1w, flowed 60 bbl., Hoover 1,860-99 ft., old T.D. 1,887 ft.

Logan County: Phillips 2 Pfuiffer, N½ NW NE 4-19-2w, dry, T.D. 5,163 ft., old T.D. 5,125 ft.

Sinclair Prairie 2 Patten, NE NW NE 18-6-8, pumped 23 bbl., T.D. 4,126 ft., old T.D. 4,100 ft.

Stephens County: Skelly 4-B Steifel, NE SW NW 35-1s-5w, pumped 30 bbl., T.D. 952 ft., old T.D. 800 ft.

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Southwest Peace Creek Test Near Completion

By CARL HOOT

ALTHOUGH drilling operations showed an upturn the last week in Kansas, completions were mostly routine. The McLouth gas pool of Jefferson County continues to expand with two wells added last week. Simpson Oil Co. 1-B Souder, Southwest Peace Creek of Reno County, has passed many of its drilling difficulties and is now testing before final completion. On tests it has flowed approximately 110 bbl. an hour for periods up to 5 hours.

Peace Creek Continues Expansion

Two more prolific producers were added to the Peace Creek pool of Reno County. In the northern end of the field, Cities Service 4 Snowbarger, NE NW 22-23-10w, was expected to make state potential of 3,000 bbl. It is one 40-acre location to the east. The same company's 3-C Kreie, SW SE SE 21-23-10w, is on the southeastern edge and broadens the area in that section.

In southern Pawnee County, Stanolind Oil & Gas Co. 1 Gilkison, SW SW 15-23-16w, southeast offset to the discovery well in the Zook pool, pumped 50 bbl. of oil from the Arbuckle dolomite at 4,160 ft.

In Cowley County, 4 miles west of Winfield, Earl Wakefield 1 Henderson pumped 24 bbl. from Kansas City lime at 2,680 ft. The well, a wildcat test, had considerable water at total depth of 3,462 ft.

KANSAS COMPLETIONS

Wildcats

Barton County, 3 mi. SW of Trapp: Falcon-Seaboard and Barnsdall 1 Gross, SW SW NE 26-16-14w, dry, T.D. 3,445 ft., Lansing 3,165 ft., conglomerate 3,384 ft., Arbuckle 3,420 ft.

Cowley County: Earl Wakefield 1 Henderson, N½ NW NW 26-32-3, pumped 24 bbl., Kansas City 2,680-2,700 ft.

Westgate-Greenland 1 Morton, N½ NE SW 2-33-5, dry, T.D. 3,133 ft., Layton 2,285 ft., Barton 2,925 ft., Mississippi lime 3,085 ft.

Ellis County: Cities Service 1 Joy, NE NE SE 24-12-19w, dry, T.D. 4,042 ft., Fort Riley 2,410 ft., Florence 2,550 ft., Topeka 3,250 ft., Lansing 3,557 ft., base Kansas City 3,763 ft., conglomerate 3,937 ft., Simpson 3,995 ft., Arbuckle 4,005 ft.

Pratt County: Shell 1 Green, SE NE SW 6-29-12w, dry, T.D. 4,736 ft., Fort Riley 2,125 ft., Florence 2,220 ft., Wreford 2,300 ft., Neva 2,535 ft., Topeka 3,284 ft., Lansing 3,855 ft., Mississippi lime 4,313-85 ft., Viola 4,439 ft., Simpson 4,536 ft., Arbuckle 4,569 ft.

Reno County: W. C. Emerich et al 1 Scott, NE SE NE 22-25-4w, dry, T.D. 4,183 ft., Topeka 2,192 ft., Lansing 2,795 ft., Mississippi lime 3,576-3,922 ft., Misener 4,022 ft., Viola 4,024 ft., Simpson 4,060 ft., Arbuckle 4,148 ft.

Fields

Ainsworth, West, Barton County: Continental 2 Harrington, SE NW SE 29-16-13w, 1,156 bbl., swabbed 41 bbl. an hr. for 6 hr., Arbuckle 3,395-3,400 ft.

Bedford, Stafford County: Stanolind 1 Meyer, NW SW NW 27-23-12w, 1,793 bbl., Arbuckle 3,817-27 ft., T.D. 3,838 ft.

Bemis, Ellis County: Deep Rock 38 Baumer, E½ SW SW 27-11-17w, pumped 100 bbl., Arbuckle 3,633-37 ft.

Big Creek, Russell County: Max Cohen 1-A Mitchell, NW SW SE 6-15-14w, dry, T.D. 3,255 ft.

National Refining 1 Mitchell, NE SE SW 6-15-14w, abandoned location.

Dayton, Phillips County: Carter Oil 2 Dusin, NW SE 35-2-19w, pumped 75 bbl., Lansing 3,168, T.D. 3,365 ft.

Eastman, Cowley County: Nelson Drlg. 1-A Crawley, SW NW NE 31-30-6, dry, T.D. 2,943 ft.

Hall-Gurney, Russell County: Cities Service 2-A Weinmeister, NW SW 25-14-13w, pumped 59 bbl., Lansing 2,881-89 ft., T.D. 3,166 ft.

Henne, McPherson County: Phil-Han Oil et al 1 Anderson, S½ SE SW 16-17-1w, pumped 744 bbl., Mississippi lime 2,635-37 ft., T.D. 3,645 ft.

Keesling, Rice County: Brown & Willard 4 Proffitt, SW NW 9-20-9w, Arbuckle 3,248-40 ft., 512 bbl., pumped 170 bbl. in 8 hr.

Cities Service 1 Dick, E½ NE SW 9-20-9w, pumped 300 bbl., pay 3,246-56 ft.

Kraft-Prusa, Barton County: Gulf 1 Peterman, NE SW SE 15-17-11w, 400 bbl., pay 3,302-21 ft.

Stanolind 3 Soeken, N½ SW NW 22-17-11w, 3,000 bbl., Arbuckle 3,284-89 ft.

McLouth, Jefferson County: Hatcher-Fisk 1 Edmonds, NE NW 21-9-20, 6,103,000 cu. ft. gas, Bartlesville 1,417-24 ft.

Hatcher-Fisk 2 Kimmel, SW SW 5-10-20, 4,500,000 cu. ft. gas, Bartlesville 1,546-69 ft.

Smyers, Rice County: Westgate-Greenland 1 Braden, NE NW NW 1-20-6w, dry, T.D. 3,384 ft.

Valley Center, Sedgwick County: Prunty Prod. 1 Wright, E¼ NE SW 12-26-1w, pumped 68 bbl., Misener 3,030-32 ft.

Virgil, Greenwood County: Shaffer & Howell 1 Schindler, NW NE NW 16-23-13, pumped 15 bbl., Mississippi lime 1,781-88 ft., T.D. 1,791 ft.

Recompletions

Greenwood County: K. T. Weideman 13-A Lewis, SW NE NW 36-27-8, pumped 25 bbl., Arbuckle 2,724 ft., T.D. 2,738 ft., old T.D. 1,090 ft.

Pawnee County: Amerada 3 Bowyer, S½ NE SW 12-20-16w, flowed 166 bbl. in 9 hr., T.D. 3,814 ft., P.B. 3,796 ft.

Miscellaneous

Jefferson County: Ed Jackson 1 Geisen, NE NW SE 5-9-21, dry, T.D. 1,585 ft., show oil 1,388-90 ft.

Leavenworth County: W. D. Dunn 1 Oglevie, NE NW SW 21-10-21, dry, T.D. 1,510 ft.

Wilcox Dry in Dawson Test

ST. JOSEPH, Mo.—Skelly 1 Wiltse in the Dawson pool of Richardson County, Nebraska, E½ NW SE 10-1n-14e, failed to produce in either the Wilcox sand or the Simpson limestone, both of which were tested the past week. The Wilcox, topped at 3,230 ft., had 3 ft. of stains, but when pipe was cemented and perforated there was only sulfur water, about 4½ bbl. an hour. Skelly then plugged back to the Simpson and perforated again, but the result was only water. It was believed the company would try again in the Viola lime, which it tested on the way down. The Viola yielded about 50 bbl. of oil daily on the swab, but went to water after acidization. Skelly's failure was a disappointment to Nebraska operators who had hoped to see a new horizon opened. The Hunton still remains the only pay for the state.

NEBRASKA COMPLETIONS

Cass County, wildcat: Sherrod & Allen 1 Seibold-Parks, NW NW SW 3-12n-11e, dry, T.D. 1,323 ft.

West Central Texas Fields

(Continued from Page 80)

Second Rig at Corbett

Eastern Stephens County's Corbett pool, producing from Marble Falls lime at around 4,000 ft., has a second active operation rigging up at Beacon Oil Co. 1 Ustick, southeast corner of the J. Hopkins Survey. The test is ¼ mile northwest of production and will be the first by the operators in the area.

Meanwhile, an east outpost, Fleming Oil Co. 4 Corbett, Section 2, S.P. Survey, was drilling at 3,450 ft. The location is 1,325 ft. northeast of 1 Corbett, the discovery, which was brought in 5 years ago.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Coleman County: H. T. Owens et al 1 M. L. Coker estate, Sec. 72, Blk. 2, G.H.&H. Sur., flowed 199 bbl. natural through ¾-in. tubing choke, gravity 46.2, C.P. 310 lb., T.P. 40 lb., gas-oil ratio 200:1, Morris sand 3,050-70 ft., T.D. 3,070 ft., *opens new pool.*

Miscellaneous

Brown County: D. C. Sneliers et al 1 J. F. Smith, J. S. Thom Sur., 53, gaged 1,000,000 cu. ft. gas after acid, lime 1,484-1,580 ft., T.D. 1,580 ft.

Deep North Turner Valley Outpost Abandoned

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural-gasoline production from all Alberta fields for the week ending May 4 averaged 28,114 bbl. daily, compared with 27,329 bbl. daily for the previous week and 26,197 bbl. daily for the corresponding week last year. The daily average included 26,835 bbl. of crude and 960 bbl. of natural gasoline from Turner Valley and 319 bbl. of crude from outside fields. There were 211 producing wells, 45 drilling, 2 finished, 2 new wells, 4 testing, 1 suspended, 3 standing, 1 abandoned, 1 new test spudded, and 1 drilling license issued.

Turner Valley Allowables

The Alberta Conservation Board has set the aggregate daily Turner Valley crude allowable at 26,102 bbl. with 158 bbl. additional for 10 small wells pending classification. This compares with 26,787 bbl. daily in April. The largest producer is Major Oils 3, with 872 bbl. daily: other ranking wells being Atlas-British Dominion 2, the most northerly producer, with 750 bbl.; Major Oils 2 with 744 bbl.; Miracle Royalties 1, with 704 bbl., and Home Oil 2, with 653 bbl. All are in North Turner Valley.

Deep Test Abandoned

In the northwest extension of North Turner Valley, Ace Royalties 2, LSD 10, 22-22-4w5, outpost deep test, was abandoned at 8,244 ft. and plugged. At this depth the drill was still in the lower Benton formation, indicating that the Madison limestone was beyond practicable drilling depth. In order to secure exploratory information on the general area, the federal government assisted in financing deepening of the well from 7,103 ft.

North Test Gets Marker

In the North Turner Valley extension, Major Oil Investments 5, LSD 14, 35-21-4w5, got the cardium-sandstone marker at 5,410 ft., indicating the lime will be reached at a practicable depth. Location is approximately 4 miles north and west of Atlas-British Dominion 2, most northerly producer, indicating good prospects of production for the intervening area.

Lime Proven to East

Major Oils 9, LSD 1, 4-21-3w5, has cemented in the top of the Madison at 7,751 ft. This is the most easterly test drilling in this area, offsetting Foothills Oil & Gas 10 in that direction, and extends the potential producing area a further quarter mile to the east.

Southern Extension Sought

Spudding of Northwest-Hudson's Bay 8, LSD 2-3, 8-18-2w5, now below 666 ft., continues the persistent search of the Northwest Co., Imperial subsidiary, for a southerly extension to the Turner Valley producing area. Other drilling activity in the south end of the field was halted a couple of years ago when faulting was shown farther to the east; but Northwest Co. has continued working farther and farther to the southwest, finishing six producers in 8-18-2w5, of which the most southerly, No. 6, in LSD 7, proved the largest, with 486 bbl daily current allowable. The present well is ¼ mile farther south and west. If production is encountered here, two inactive tests about ½ mile farther south, Brown 6 at 4,600 ft. and Theo Grewer 1 at 1,200 ft., will likely be completed. A sole fault encountered in National Petroleum 2 has not been encountered in any of the Northwest-Hudson's Bay wells, indicating there are still possibilities of a southerly extension of production.

Pouce Coupe Test

On the Pouce Coupe structure, in the northern Alberta foothills west of Peace River, Bonanza Royalties 1, LSD 16, 22-80-13w6, has spudded and is coring a potential sand around 660 ft. The well will test an extensive structure which has already shown good indications of commercial oil and gas production.

Lacombe Survey

Joseph S. Irwin, geologist, of Calgary, has completed a survey of acreage of the Lacombe-Red Deer Gas & Oil Co. about 6 miles southeast of Lacombe, Alta. Labombe 1 has been located in LSD 3, 13-40-26w4, with natural gas as the primary objective.

Tilley Field

In the Tilley field, eastern Alberta, Northwest Co. 4, LSD 5, 17-17-12w4, finished in the lime at 3,182 ft., has developed some gas production with 1,440 lb. pressure, but very little oil. Northwest 3, LSD 13, 17-16-12w4, is coring below 3,106 ft. and nearing the lime. Northwest 2, LSD 4, 17-17-12w4, crude discovery well, is producing 40 to 60 bbl. of crude daily, but with some increase in water.

Ross Lake Prospect

Standard Oil of British Columbia has completed arrangements to take over from E. L. Cord and the Western Drilling Co. holdings of more than 11,000 acres in the Ross Lake-Twin River areas of southern Alberta, including holdings on the McIntyre ranch. Acreage has also been acquired from Joseph S. Irwin, geologist, of Calgary, who first reported on the area in 1929 for Nordon Oil Corp. Standard will make a seismograph survey, on the basis of which a commercial test will be located later this spring. The general area already has a small production in two wells drilled to the top of the Madison limestone.

In the Twin River area, southern Alberta, Pan American Oils 1 has been located by Geologist Russell V. Johnson in LSD 9, 26-1-20w4. Location is on a tract of more than 700 acres between Cord 1 and Del Bonita 1 producers, and drilling equipment will be moved in as soon as official permit is secured.

Monitor Test Abandoned

In the Monitor district, eastern Alberta, McColl-Frontenac 2, LSD 16, 17-29-5w4, finished a dry hole in the lime at 3,680 ft., and has been abandoned.

In the Nanton area, southern Alberta, H. C. Bickel, of Philadelphia, has a crew at work on a geophysical survey for Northwest Co. The work will probably be completed this month.

Tar Sand Prospects

Construction of the Alaska Highway through northern Alberta may result in more extensive development of the Athabaska tar sands near McMurray. At present, Abasand Oils, headed by Max W. Ball, has a separation plant in operation with a capacity of 600 bbl. daily. The sand is dug from exposed deposits with powered scoop shovels. The sand is agitated with hot water, separating the oil, securing close to 99 per cent recovery; production averaging 0.9 bbl. of oil to the ton of sand. The output can readily be increased by erection of additional units. There is also the possibility that, where the deposits are remote

(Continued on Page 95)

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OHIO, INDIANA, KENTUCKY

New Area Opened in Eastern Part of Clinton Gas Field

ZANESVILLE, Ohio.—A gasser gaging better than 9,000,000 cu. ft. open flow was tapped in the Clinton horizon in Holmes County. The well is located 3 miles southeast of Loudenville on the eastern extremity of the Central Ohio Clinton field. The test shows virgin rock pressure of 1,320 lb. Other completions were scattered.

OHIO COMPLETIONS

Ashland County, Lake Township: Ray Stewart 1 George Long, Sec. 11, dry, no Clinton sand, T.D. 3,105 ft.

Cuyahoga County, Brecksville Township: H. C. Crow et al 1 Virginia State Bank, Lot 56, 180,000 cu. ft. gas, shot, Clinton, T.D. 3,600 ft.

Holmes County, Washington Township: Ohio Fuel Gas Co. 1 Schuyler Jarvis, Sec. 17, 9,220,000 cu. ft. gas, Clinton 2,968-83 ft., T.D. 2,989 ft.

Hocking County, Ward Township: Kachelmacker estate 2 L. D. Poston, Sec. 20, 500,000 cu. ft. gas, Injun, T.D. 415 ft.

Knox County, Union Township: Ohio Fuel 1 William McElroy, Sec. 17, 520,000 cu. ft. gas, Clinton, T.D. 2,880 ft.

Licking County, Madison Township: Ohio Fuel 1 Mary Haluczik, Lot 8, 210,000 cu. ft. gas, Clinton 2,451-89 ft., T.D. 2,491 ft.

Bowling Green Township: Fred W. Abbott et al 3 Currie-Caldwell, NE Sec. 2, 55 bbl. after shot, Clinton sand, T.D. 3,048 ft., oil was swabbed.

Medina County, Hinckley Township: Harry Dempsey et al 1 Charles Searles, Lot 52, 2,260,000 cu. ft. gas, shot, Clinton, T.D. 3,525 ft.

Meigs County, Rutland Township: Fleming et al 2 F. S. Nelson, Sec. 28, 600,000 cu. ft. gas, Maxson, T.D. 784 ft.

Orange Township: Ohio Fuel Gas Co. 2 Nevada Guthrie, Sec. 36, near Alfred, 900,000 cu. ft. gas, first Berea, T.D. 1,650 ft.

Monroe County, Seneca Township: Spangler & McCost 1 J. R. Stephens, Sec. 50,000 cu. ft. gas, shot, Berea, T.D. 1,800 ft.

Morgan County, York Township: Swingle et al 1 I. C. Spring, Sec. 25, 130,000 cu. ft. gas, Berea, T.D. 1,132 ft.

Muskingum County, Washington Township: Wittmer Co. 2 Charles S. Mock, Lot 9-N, 520,000 cu. ft. gas, shot, Clinton, T.D. 4,062 ft.

Noble County, Beaver Township: R. M. Burns 1 Charles Gallagher, Sec. 3, 40,000 cu. ft. gas, shot, Berea, T.D. 1,698 ft.

Seneca Township: S. E. Ruby 1 J. W. Runy heirs, 500,000 cu. ft. gas, Salt sand, T.D. 733 ft.

Perry County, Monroe Township: Hermey Bros. 26 David C. Hermey, SW Sec. 27, 7 bbl. after shot, Berea, T.D. 1,105 ft.

Marshall & Marshall 35 M. Donahue heirs, NW Sec. 14, 2 bbl., Berea, T.D. 1,139 ft.

Clayton Township: Palm Oil Co. 5 Z. T. Lyons, Sec. 16, 85 bbl., shot, Clinton 3,387-3,407 ft., T.D. 3,414 ft.

Preston Oil 1 Joseph W. Wilson, Sec. 6, 4 bbl., shot, Clinton 3,138-93 ft., T.D. 3,203 ft.; (Clinton sand gas well drilled deeper).

Pure Oil 4 B. J. Williams, SE Sec. 7, 150 bbl. oil and 100,000 cu. ft. gas, Clinton sand 3,260 ft.

Stack County, Perry Township: East Ohio 1 Susan Hawk, Sec. 35, 1,250,000 cu. ft. gas, shot, Clinton, T.D. 4,550 ft.

Washington County, Barlow Township: Anderson et al 3 Pearl Flannery, Sec. 3, 50,000 cu. ft. gas, Squaw, T.D. 1,560 ft.

Newport Township: Newport Oil Co. 25 A. Adkins, Sec. 27, ½ bbl., shot, first Cow Run, T.D. 455 ft.

Wesley Township: Orndoff & Burt 1 J. M. Fawcett, Fraction 32, dry, Injun (water), T.D. 1,215 ft.

INDIANA

EVANSVILLE, Ind.—Tide Water Associated 1 Oeth, SW SW 5-7s-12w, in the new field east of Mount Vernon in Posey County, at week's end were still attempting to free tools which stuck following a 30-qt. shot in the Aux Vases at a total depth of 2,633 ft. Gulf 1 Frank Schutte, NE NW 8-7s-12w, another test in the same area, also had packer and tubing stuck when the well was squeezed to shut out water.

Meanwhile, W. C. McBride 1 A. Grabert, NE SE NE 7-7s-12w, about ¼ mile southwest of the field's discovery well, has been abandoned through the McClosky at a total depth of 2,748 ft.

The Sun Oil Co. at latest reports was still cleaning and testing its 1 L. C. Byrd, NE SE 4-8s-14w, a pool opener in the extreme southwestern corner of Posey County. In its best 24-hour test the well swabbed 50 bbl. of oil. It is producing from the Aux Vases at 2,602-21 ft. and the McClosky at 2,649-43 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—One oil well and two gas wells were reported completed in eastern Kentucky this week as drilling activities took a slightly upward turn. Several new locations were reported and in some instances roads have been completed and rigs are being built.

May and Anyx have completed No. 2 on the Rufus Johnson tract on Duck Fork in Lee County with an estimated production of 10 bbl. of oil per day.

Inland Gas Corp. hit a dry hole in No. 230 on the Tobe Dixon land in Johnson County with the well reaching a total depth of 2,858 ft. in slate and shells.

The Kentucky-West Virginia Gas Co. has completed No. 667 on the Daniel Wicker tract in Knott County at a total depth of 2,727 ft. in shale with an open flow of 267,000 cu. ft. of gas after shot.

The Kentucky-West Virginia Gas Co. also reports the completion of No. 5384 on the William Jones land in Knott County at a total depth of 2,460 ft. in shale. The well has an open flow of 467,000 cu. ft. of gas after shot.

WESTERN KENTUCKY

Snowden-McSweeney 1 Chase, SE SE SW 19-Q-26, ½ mile southwest of Reed in Henderson County, is to be acidized in the McClosky at 1,974-78 ft. where a light show of oil was found. The test is near Chenault & Farmer 1 Glenmore Distillery which has been completed as a small McClosky producer on the pump.

WESTERN KENTUCKY COMPLETIONS

Daviess County: Miller & Shiarella 1 Birk, 3-P-28, near Stanley, dry in St. Louis lime at 1,825 ft.

California Fields

(Continued from Page 72)

other two, but this might not be any criterion of its future status.

Texas Co. has reached a deph of 8,290 ft. in 2-A McNally in the La Mirada wildcat area west of the West Coyote field and northwest of the Buena Park field but has not yet found anything resembling commercial production. This area will require deep drilling, but something should be turning up shortly if success is to crown the efforts of the company to open up a new productive field at this point. Texas has resumed drilling operations in 1 Buena Park Unit 1 after landing surface pipe at 1,008 ft., but it will be several months before this well reaches the top of the pay as Buena Park requires deep drilling. In the meantime Texas is preparing to spud in 4-E-1 Buena Park in 36-3s-11w and with the addition of these two new wells the trend of the structure should be definitely determined. Frankley & Harriman are going back into the Huntington Beach field of Orange County and have accordingly staked location for a deep test to be drilled on the Mills lease in 13-6s-11w. This location puts the well in the extreme southeastern end of the Huntington Beach field in an area that has been tried several times with varying results. Some have been of the opinion that the Mills property and a portion of the Surf property should be productive with careful work as the oil sand is not very thick. A little production was at one time found in this area, but sustained production could not be obtained and development work was abandoned.

LOS ANGELES BASIN COMPLETIONS

Dominguez, Los Angeles County: Union Oil Co. 56 Callender, 29-3s-13w, flowed 260 bbl., 31.2-gravity, 5 per cent cut, 640,000 cu. ft. gas, 76/64-in. bean, pressures 30/300 lb., T.D. 7,288 ft., perf. 6,894-7,284

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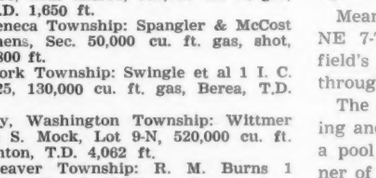

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ft., gun-perf. 6,655-85 ft., 6,700-30 ft., 6,770-90 ft., 6,800-24 ft., recompleted in seventh and eighth Callender zones of Miocene age after hole redrilled from 5,215 ft.

Richfield wildcat district, Los Angeles County: South Basin Oil Co. 103 Richfield, 24-3s-9w, dry, T.D. 4,774 ft., Kraemer shale 4,180 ft., Kraemer oil zone consisted of gray sand 4,706 ft.

Torrance, Los Angeles County: Sam Bernstein 1 Barnes, 30-4s-13w, pumped 250 bbl., 16.1-gravity, 3 per cent cut, T.D. 3,727 ft., perf. 3,087-3,327 ft., 3,462-3,727 ft., completed in Ranger zone of Pliocene age.

Wilmington, Los Angeles County, R. & S. Oil Co. 2 Banning, 32-4s-13w, pumped 70 bbl., 13.2-gravity, 5 per cent cut, T.D. 3,640 ft., perf. 2,702-62 ft., 2,893-3,208 ft., 3,343-63 ft., recompleted in Ranger zone of Pliocene age after hole whipstocked from 2,704 ft. and redrilled to present depth.

Newhall-Potrero Outpost Near Test

Barnsdall Oil Co. is preparing to drill out cement in 31 Rancho San Francisco, an outpost in the Newhall-Potrero field of Los Angeles County, following the cementing of 7-in. casing at 6,550 ft. with 500 sacks of cement. This well, which is located south of the Newhall-Potrero fault, will extend the productive limits of the field if it is completed as a good flowing well and will likewise prove up all intervening acreage between the well and 1 Ferguson of C. G. Willis, which is located about 1 mile southeast of the Newhall-Potrero field. Barnsdall will be able to proceed with development work again in this field as it will have about 360 acres available for work and will be able to operate on the 40-acre spacing program. When M-68 became effective Barnsdall was forced to suspend work on two wells because they were being drilled on acreage substantially less than 40 acres. Both were spudded in after the deadline covered by M-68 and could not be completed. Texas Co. is preparing to drill a wildcat northwest of the northern limits of production at Newhall-Potrero, but spud will not be made for another 10 days. This wildcat will be drilled in 22-4n-17w and would either extend the productive limits of the Newhall-Potrero field to the northwest or open up a new oil field. Because Barnsdall has not drilled a dry hole in this field the limits of production in all directions are still wide open. Faulting along the western edge of the field is generally believed to mark the outer limits in this direction, but since no dry holes have been drilled this is not definitely certain. The same situation existed along the south boundary of the field and 31 Rancho San Francisco, which the company is now drilling, has proved this faulting apparently does not extend down into the Miocene.

Western Gulf Oil Co., discoverer of the Oak Canyon field of Los Angeles County, has staked location for 2 Gilmore U.S. and immediate work is contemplated. This new well will be drilled 790 ft. south and 416 ft. east of the NW cor. SW NW 32-5n-17w. The Oak Canyon field looks like a very excellent accumulation and will ultimately become a factor in production when additional oil is needed. In the meantime, Western Gulf is curtailing all wells to a minimum in accordance with the existing conservation program.

COASTAL DISTRICT COMPLETIONS

Cat Canyon, Santa Barbara County: Union Oil Co. 14 Bell, 27-9n-33w, flowed by agitation 648 bbl., 15.9-gravity, 0.9 per cent cut, 128/64-in. bean, pressures 75/155 lb., T.D. 5,807 ft., perf. 5,159-5,805 ft., completed in Los Flores zone of Miocene age.

Fillmore wildcat district, Ventura County: W. E. McCaslin 1 Riley, 18-4n-19w, abandoned as a dry hole, T.D. 2,309 ft., no productive oil sand found.

Huasna wildcat district, San Luis Obispo County: Harvey Tex Oil Co. 1 Huasna, 11-32s-14w, dry, T.D. 3,010 ft., numerous small stringers of oil sand found but not enough to produce commercially.

Harvey Tex Oil Co. 2 Huasna, 11-32s-14w, dry, T.D. 4,999 ft., not enough oil sand found to produce.

Ventura Avenue, Ventura County: Lloyd Corp. 2 Lloyd, 23-3n-23w, flowed 525 bbl., 32.9-gravity, 1 per cent cut, 500,000 cu. ft. gas, 24/64-in. bean, pressures 300/900 lb., T.D. 9,976 ft., P.B. 9,145 ft., gun-perf. 8,805-65 ft., roiginally completed in lower Lloyd zone with string of drill pipe stuck on bottom and when production dropped the hole was plugged back and gun-perforated opposite upper showings.

NORTH LOUISIANA, ARKANSAS

Haynesville and Arkansas Sour Gas Area Lead in Drilling

SHREVEPORT, La.—The Haynesville field led the tri-state district in activity as 10 wells were completed during the past week and an eleventh was swabbing oil. In addition to the completions listed below, Mid-States 1 L. P. Barker, 21-23-8, flowed several hours but died swabbing daily. The wells are all in the deep pay.

In Arkansas, the only producer completed was Lyons 1 Dodson at Dorcheat. This well ran slightly higher than was expected, and may call for more development on the north flank of the structure than was anticipated by the operators when they applied for 80-acre spacing last March. The leases on the north flank are, however, all long eighties and according to present interpretations of the structure, this would throw the next line

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of wells to the north below the water level. Stacy 1 Barton, SW SE 11-18-22, three locations east of the Lyons well, is expected to be a short distance downstructure on the northeast side. When this well is completed, it can be determined whether or not a revision of the structure contours will be necessary. (See The Oil and Gas Journal, Mar. 26, 1942, p. 250.)

Macedonia and McKamie were also active with five and two drilling wells respectively. These three fields form an important gas reserve which is being developed under blanket exceptions to M-68 in order to provide gas for the rapidly developing Arkansas war industries.

ARKANSAS COMPLETIONS

Wildcat, Ouachita County, 2 miles W of Mount Holly: Haynes B. Ownby 1 Wilson, SW NE 26-15s-18w, dry, T.D. 3,500 ft.

Dorcheat, Lafayette County: C. H. Lyons 1 Dodson, SE SE 10-18s-24w, elev. 263 ft., flowed 108 bbl. in 12 hr. through choke, pay 8,900-05 ft., porosity 8,841 ft.

East El Dorado, Union County: J. C. Schmidt 1 Spooner, SE SE 9-17s-14w, dry, T.D. 2,900 ft.

Stephens, Columbia County: Haynes B. Ownby 1 Smart, NW NE NE 13-15s-20w, dry, T.D. 3,428 ft.

NORTH LOUISIANA COMPLETIONS

Wildcat, Rapides Parish, midway between Hollaway and Buckeye: Roland S. Bond 1 O'Neill, SW NW NW 20-5n-3e, dry, T.D. 6,015 ft.

Caddo, Caddo Parish: Fryer Drlg. Co. 1-A Oil City L. & L., 7-20-15, dry at 3,041 ft.

A. P. Gilbert 1 Thigpen-Herold, 35-22-16, pumping 25 bbl. at 2,465 ft.

A. P. Gilbert 1 J. S. Ashley, 35-22-16, dry at 3,100 ft.

Haynesville, Claiborne Parish: Arkansas Fuel Gas 9 L. L. Beene, 15-23-8, 197 bbl. in 7 hr., ¼-in. choke, C.P. 600 lb., T.P. 650 lb., acid, perf. 5,210-32 ft., T.D. 5,302 ft.

Blackwell Oil & Gas 1 Waller-Taylor, 11-23-8, 97 bbl. an hr., ⅜-in. choke, C.P. 700 lb., T.P. 300 lb., perf. 5,276-5,312 ft. and 5,352-57 ft., T.D. 5,420 ft.

Gulf 1 Garrett Comm., 24-23-8, 62 bbl. an hr., 37/64-in. choke, C.P. 575 lb., T.P. 350 lb., perf. 5,344-64 ft., T.D. 5,420 ft.

Ohio 1 L. P. Parker, Acct. 3p, 20-23-8, 23 bbl. an hr., C.P. 300 lb., T.P. 50 lb., T.D. 5,564 ft.

Ohio 1-A R. L. Bond, Acct. 2p, 21-23-8, 200 bbl. in 10 hr., C.P. 900 lb., T.P. 200 lb., perf. 5,288-98 ft. and 5,324-54 ft., T.D. 5,420 ft.

Ohio 1 W. E. DeLoach, 22-23-8, 133 bbl. in 5 hr., C.P. 725 lb., T.P. 325 lb., T.D. 5,500 ft.

Ohio 1 J. H. Goodwin, 30 bbl. an hr., ¼-in. choke, C.P. 800 lb., T.P. 700 lb., T.D. 5,370 ft.

Ohio 1 Sherman-Hunt, 16-23-8, 185 bbl. in 5 hr., ¼-in. choke, C.P. 675 lb., T.P. 550 lb., 5,295-5,312 ft. and 5,336-58 ft.

Ohio 1 J. R. Sherman, 23-23-8, 46 bbl. in 2 hr., perf. 5,315-43 ft. and 5,381-89 ft., T.D. 5,460 ft.

Ohio 1 J. T. Waller, Acct. 4p, 209 bbl. in 5 hr., ⅝-in. choke, C.P. 700 lb., T.P. 500 lb., perf. 5,234-43 ft., 5,264-70 ft. and 5,311-17 ft., T.D. 5,360 ft.

Nebo, La Salle Parish, H. L. Hunt F-111 Goodpine, NE NW 28-7n-3e, pumped 90 bbl. 3,534-3,450 ft., T.D. 4,145 ft.

Permian Basin, Panhandle

(Continued from Page 74)

Barnhart, Reagan County: Amerada 1-ARC University, NE Sec. 4, Blk. 48, University Sur., *twin to No. 1-RC*, elev. 2,782 ft., flowed 544 bbl. in 7½ hr. through tubing after acid, pay 9,012 ft., base black shale 8,967 ft., T.D. 9,178 ft., P.B. 9,128 ft.

Amerada 1-RE University, 1,980 ft. from S and E lines, Sec. 9, Blk. 48, University Sur., *1½ mi. SE of No. 1-RB producer*, elev. 2,726 ft., flowed 210 bbl. through ⅝-in. choke on tubing after acid, cut 13 per cent with salt water, pay 9,173 ft., base black shale 9,031 ft., T.D. 9,301 ft., P.B. 9,240 ft.

Clara Couch, Crockett County: Humble 1-D J. W. Owens, 660 ft. from N line and 1,980 ft. from E line, Sec. 15, Blk. GG, H.E.&W.T. Sur., *1½ mi. NW of discovery*, pumped 208 bbl. after acid, pay 1,945 ft., T.D. 2,000 ft.

Humble 1-E Owens, 1,980 ft. from S line and 660 ft. from E line, Sec. 15, Blk. GG, H.E.&W.T. Sur., *1 mi. NW of discovery*, dry, sulfur water 2,185 ft., T.D. 2,240 ft.

Keystone Colby, Winkler County: Tide Water 1 C. H. O'Pool, 550 ft. from N and W lines, NE Sec. 28, Blk. B-3, P.S.L. Sur., *southeast outpost*, elev. 2,887 ft., flowed 413 bbl. through casing after shot, pay 3,157 ft., T.D. 3,331 ft.

Sand Hills, Crane County: Humble 67 Tubb, 440 ft. from N line and 1,980 ft. from W line, Sec. 5, Blk. 32, P.S.L. Sur., elev. 2,618 ft., flowed 668 bbl. through tubing after acid, pay 4,345 ft., T.D. 4,596 ft.

Waddell, Ector County: Atlantic 2-F University, 330 ft. from S line and 1,380 ft. from W line, Sec. 5, Blk. 35, University Sur., elev. 2,850 ft., pumped 182 bbl. after shot, pay 3,622 ft., T.D. 3,646 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M.—An increase in completions was reported for the past week in Southeast New Mexico. Seven producers were brought in for a total potential of 2,106 bbl. Loco Hills pool of Eddy County gained a large producer in the Dixon & Yates 2 Day which flowed 984 bbl. a day through ¾-in. choke on tubing set at 2,735 ft., 10 ft. off bottom. Most active area, however, is the Square Lake pool of northern Eddy County where four oil wells were completed for a total of 657 bbl. initial production and five new wells were started.

SOUTHEAST NEW MEXICO COMPLETIONS

Loco Hills, Eddy County: Dixon & Yates 2 Day, 12-18-29, flowed 984 bbl. through choke on 2-in. set at 2,735 ft., pay 2,690 ft., T.D. 2,745 ft., shot 2,680 ft.

Monument, Lea County: E. B. Clark 1 Cooper, SW NE NW 3-20-37, flowed 225 bbl. through open tubing set at 3,876 ft., pay 3,810 ft., T.D. 3,876 ft., acid.

M. & M. Prod. 1-A Weier, NW NW SW 3-20-37, flowed 240 bbl. through open tubing set at 3,872 ft., pay 3,850 ft., T.D. 3,876 ft., acid and shot.

Salt Lake, Lea County: Continental 2 Smith-18, SW NE 18-20-33, dry, T.D. 3,074 ft.

Leonard & Welch 2 State, SW NW 18-20-33, pumped 7 bbl. of fluid, half water, 3,001-04 ft., acid.

Square Lake, Eddy County: Etz Oil Co. 1-E Etz, 25-16-30, flowed 187 bbl. through tubing, pay 3,042 ft., T.D. 3,235 ft.

McDonald Oil Co. 1 Grier, 30-16-31, flowed 185 bbl. through casing, main pay 3,055 ft., T.D. 3,108 ft.

Sanders Bros. 3 Etz, 34-16-30, flowed 185 bbl. through tubing, pay 2,975-3,040 ft., shot.

Choate & Brown 2 Hover-State, 2-17-30, pay 2,982 ft., T.D. 3,062 ft., shot.

TEXAS PANHANDLE COMPLETIONS

Gray County: Phillips 8 Pan-Baer-B, Sec. 125, Blk. 3, I.&G.N. Sur., potential 125 bbl., T.D. 3,292 ft.

Phillips 9 Pan-Baer-B, Sec. 125, Blk. 3, I.&G.N. Sur., potential 319 bbl., T.D. 3,294 ft.

Smith Brothers 2 Arends, Sec. 114, Blk. 3, I.&G.N. Sur., potential 281 bbl., T.D. 3,300 ft.

Texas 13 A. Chapman-A, Sec. 50, Blk. A-9, H.&G.N. Sur., potential 215 bbl., T.D. 2,822 ft.

Hutchinson County: Shell 4 Terry, Sec. 15, Blk. M-21, T.C.R.R. Sur., potential 200 bbl., T.D. 2,065 ft.

Sinclair 5 Merchant Vacuum, Sec. 37, Blk. 47, H.& T.C. Sur., old well, old T.D. 2,724 ft., T.D. 2,808 ft., pumped 159 bbl. natural.

Stanolind 2 Starned, Sec. 24, Blk. M-23, T.C.R.R. Sur., potential 186 bbl., T.D. 3,180 ft.

Texas Gulf Coast

(Continued from Page 82)

214 bbl., 9/64-in. choke, perf. casing 5,206-22 ft., T.D. 5,223 ft.

Phillips 7 J. B. Johnson, 9 bbl., 9 hr., 3/32-in. choke, perf. casing 5,197-5,221 ft., T.D. 5,270 ft.

Old Ocean, Brazoria County: Harrison & Abercrombie 1 Wooding & Mauller, 457 bbl., ¼-in. choke, top sand 10,005 ft., T.D. 10,994 ft.

Port Neches, Orange County: Texas 12-B Polk, 17 bbl. pumping, perf. casing 2,891-94 ft., T.D. 5,280 ft.

South Mauritz, Jackson County: J. B. Coffee, 90 bbl. oil and 7 per cent salt water, perf. casing 5,447-62 ft., T.D. 6,760 ft.

West Ranch, Jackson County: Magnolia 224-A West Ranch, 138 bbl., 7/64-in. choke, perf. casing 5,736-40 ft., T.D. 5,750 ft.

West Columbia, Brazoria County: Texas 46 Abrams, 541 bbl., ¼-in. choke, perf. casing 5,696-5,717 ft., T.D. 5,760 ft.

Withers, Wharton County: F. W. Michaux 57-A Pierce, 171 bbl., 5/32-in. choke, perf. casing 5,304-14 ft., T.D. 5,360 ft.

F. W. Michaux 59-A Pierce, 180 bbl., 5/32-in. choke, perf. casing 5,359-65 ft., T.D. 5,390 ft.

Texas 105-A Pierce, 116 bbl., ⅛-in. choke, perf. casing 5,300-10 ft., T.D. 5,390 ft.

Wildcats

Newton County: Kirby 1 J. M. Muldoon, top Frio 2,220 ft., Textularia Warreni 4,502 ft., Whitsett 4,886 ft., Massalina Pratti 4,943 ft., Cordell 5,532 ft., Moody Branch 5,682 ft., Cook Mountain 6,780 ft.

Wharton County: Pierce Withers 1 Wharton Bank & Trust Co., dry, T.D. 6,016 ft.

Rocky Mountain Area

(Continued from Page 79)

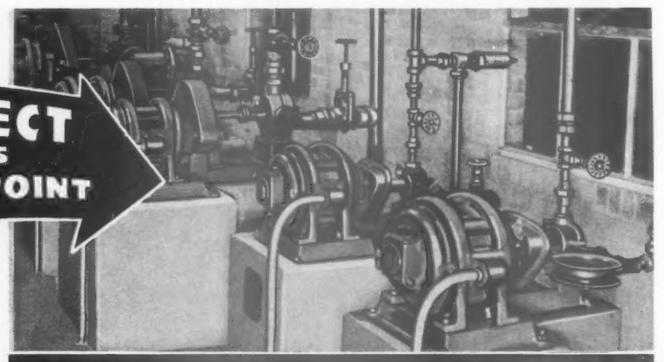
southwest, although two gas wells were completed on top years ago. Several wells closer in have been drilled to the oil pay south of the fault.

WYOMING COMPLETIONS

Circle Ridge, Fremont County: Continental Oil 5 Shoshone Indian lease, CEL NE 1-6n-3w, T.D. 690 ft., topped saturation in Tensleep at 564 ft., set 8⅝-in. at 569 ft., bailed 8 bbl. an hour or rate 192 bbl. a day, no water, shut in for pumping test.

MONTANA COMPLETIONS

Cut Bank, Glacier County: Texas Co. 4 Miller, SE SE SE 29-33n-5w, T.D. 2,996 ft., 7-in. 2,965 ft., small show oil in Sunburst at 2,905-30 ft., Cut Bank sand 2,955-94 ft., main pay 2,975-94 ft., 800 ft. oil



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in hole, swabbed 65 bbl. first 24 hr., swabbed 15 bbl. each 8-hr. period after shot.

Santa Rita Oil & Gas 5 Jordan, NE NE 18-32n-5w, T.D. 2,926 ft., 7-in. 2,868 ft., Cut Bank 2,864-2,918 ft., main pay 2,890-2,918 ft., 1,500 ft. oil in hole, swabbing for test.

Kevin-Sunburst, Toole County: Peterson & Sorenson 1 Government, SW NW SE 18-35n-3w, T.D. 2,504 ft., in top of Madison lime, pumped 40 bbl. from 2,496-2,503 ft., pumped 200 bbl. after acid first day, then averaged 35 bbl. a day on a 10-day test beaned down with 750 lb. pressure on tubing.

Imperial-Craig 7 Martin, NE NE SW 17-35n-1w, T.D. 1,644 ft., contact 1,623-33 ft., pumped 4 bbl. per day natural, will acidize.

J. H. Agen 5 Goeddertz, CSL SW SE 16-35n-3w, T.D. 1,812 ft., contact 1,806 ft., averaged 7 bbl. a day on 10-day pumping test.

Coolidge & Coolidge 4 Waite, C NW SE 13-35n-2w, T.D. 1,535 ft. in top of contact, gas blew tools 150 ft. up hole, swabbed 100 bbl. natural in 12½ hr., will acidize with 1,000 gal.

Prevol & Shay 9 Government, SE SE SE 10-35n-3w, T.D. 1,819 ft., acidized 500 gal., averaged 5 bbl. daily on 10-day pumping test.

•

Miller Asks Action That Will Elevate Natural-Gasoline Use

(Continued from Page 29)

various nicknames but all this reputation was ingenuously buried by the simple expedient of renaming the child "natural gasoline" hence the assumed name of the association.

I am not trying to be funny in this historical recital—the history itself is a comedy of abuse and lost opportunity. Think back again to the area of the kerosene blend, when we or our customers, the blenders, developed a tremendous market for our products but greed or ignorance of useful motor-fuel quality abused that opportunity. Wrong grades of natural gasoline were mixed with wrong refinery products and a rotten motor fuel was foisted on a misled public until that public rebelled and we are still trying to live down the reputation thus acquired. It is still common gossip that one of the larger oil companies, which was a leading distributor of the kerosene blend, has from that day tried to saddle all responsibility on natural gasoline for the debacle and take pride in telling the world they have never since used a drop of our product. In fact, the president of one of our own member companies has a standing offer of a suit of clothes to the first salesman selling that company a car of natural gasoline.

Another abuse, real or fancied, but potent nonetheless, is the constant bickering about quality and specifications and the frequent accusations by one seller that another is shipping off-specifications material to a customer for whose business they are competing. Many buyers have little opportunity to check specifications accurately, particularly octane and vapor pressure and any cheating in this regard by shippers reacts against the whole industry.

A Conservation Contribution

Let us encourage more dignity in our business. Let us remember always and proclaim to the world that our product is just as legitimate as any refinery product. We are a conservation function of crude oil and natural-gas production. The quantity of our output is governed solely by the allowable production of oil and gas. We are not susceptible of proration, except as the oil and gas wells are prorated. When they produce a barrel of oil or a thousand cubic feet of gas, it is our duty and opportunity to save the accompanying and otherwise wasted natural gasoline. Natural gasoline is an integral part of such petroleum production and no apologies are necessary for its appearance in the markets. Only ignorance or unfairness can gainsay this truth. Let us shout our legitimacy to the world and force acknowledgment from the world that we are a worthy member of the petroleum family. You and I know that we tried to take our appropriate place in the council chambers of the unfortunate NRA, but for the most part we were tied up in the woodshed. We had little opportunity to be heard in the deliberations of subjects vitally affecting our existence. So it is with the war emergency. Until last week we were a sort of appendage in the Oil Coordinator's Office. We were not consulted. Our association's offers of cooperation and demands for proper representation were largely ignored. We were still an orphan. We were that "damned casinghead kid."

Perhaps the best illustration of how our problems have been ignored in Washington where orders and directions affecting the petroleum industry are issued hastily, is the recent ODT General Order No. 7 directing the railroads to refuse tank-car loadings of petroleum products for shipment to destinations of less than 100 miles by shortest published tariff routes. So far as I can learn, no informed consideration was given as to the effect of such an order on the transportation of natural gasoline, butanes, isopentanes and liquefied gases. I can find no manufacturer who was consulted to learn if such an order would disrupt shipments of these products to defense plants or commercial customers. I can find no evidence that surveys were made to determine the availability of trucks with pressure tanks to take over such disrupted transportation. I can find no evidence that any survey was made to determine the amount of equipment necessary to build loading and unloading facilities for truck movement. I understand the manufacturers of other high pressure and corrosive products were likewise forgotten before the issuance of the order. Now the order, after being protested, has been postponed for 15 days. We have proffered our services in making necessary surveys to determine the effect and utility of such an order. We would like to be helpful in this transportation emergency. We would like to demonstrate to the world that we are just as patriotic as any other industry and our offers of service and cooperation have been dictated by unselfish motives. Recognizing that we are a minor branch of the petroleum industry, we have couched the wording of such offers in terms our position seemed to justify. Do we have to use a club to beat someone over the head in order to convince them of our sincerity?

Our representatives in the Natural Gas and Natural Gasoline Section have been doing yeoman service in our behalf. They have had no seat heretofore in the policy-making councils, but have had to await the announcement of policies already determined and then when they found that the effect of such policies unnecessarily jeopardized our operations, they set out militantly to correct the unnecessary evils.

Now, we have been accorded proper representation in the OPC, but we are still orphans in many other agencies in Washington where our interests are highly involved. Let us strive to gain and merit such representation in these agencies.

•

Location Made in South Dakota For Test to Pre-Cambrian

PIERRE, S. D.—Announcement by the Central South Dakota Oil & Gas Co. of Pierre of plans for sinking the first deep test well in Hughes County, is the latest development in the South Dakota exploration activity, which has attracted the attention of many major oil companies as well as independent operators during the last 3 years.

Nearly 5,000,000 acres of land are reported under oil and gas lease in the state. Leasing of both private and public lands is continuing.

The new Hughes County location is in SE 18-11n-76w, and will be drilled by Harris & Co., recently incorporated drilling firm of Pierre, headed by W. L. Harris, Oklahoma City, Okla.

The contract, according to Howard Van Camp, secretary of the operating company, provides for testing all formations down to pre-Cambrian, which geologists calculate will be found at not more than 4,500 ft.

The location is on a block of more than 30,000 acres taken by the company. The leases cover most of an area of high magnetic intensity as mapped by the South Dakota Geological Survey and by Kerr-Lynn & Co., Oklahoma City, which has an acreage interest in the block. Drill site is across the Missouri River from the other deep tests made in Central South Dakota in recent years. In the Standing Butte test, drilled in Stanley County several years ago, showings of oil were found in the younger formations but it was abandoned on reaching the Pahasapa limestone.

In 1940, two "slim holes" were drilled by the Carter Oil Co. in Potter and Stanley counties but results of the tests have never been announced although each of them penetrated about 4,000 ft. of sedimentary formations.

The only information on formations in Hughes County is furnished from a test which was started in the Blunt region, 7 miles north of the new location and a core hole drilled by Kerr-Lynn about 7 miles east of Pierre in 1939. Both holes were abandoned when heavy artesian-water flows were encountered, one in the Dakota formation and the other in the Sundance series below the Dakota-Lakota sandstones.

The Kerr-Lynn hole encountered one of the largest amounts of natural gas in the Dakota sandstone of any well ever drilled in the Pierre vicinity. Natural gas has been produced from wells at Pierre and Fort Pierre for more than 40 years.

A map published recently by the South Dakota Geological Survey shows a number of structures with high magnetic intensities in Central South Dakota. The new well is located on one and Pierre and Fort Pierre on another.

Three or four other new tests may be drilled in South Dakota this summer if equipment is available. Preparations for drilling operations are reported being made on the Moss Agate block about 15 miles north of Edgemont in Fall River County and a group of Denver, Colo., men are reported negotiating for a test near Rumford, in the same county in the northern part of Township 11s Range 4e. The location is on the Hat Creek structure which has long attracted the attention of geologists.

Little information has become available on three oil tests undertaken in South Dakota last year. Operations were continuing near Rapid City where a test is being drilled by Lem Johnson of Newcastle, Wyo., for a group of Rapid City business men; in the Elbo Bend area near Belle Fourche where Adolph Amunson and Martin J. O'Brien of Newell are drilling a shallow test and near Fairburn in Custer County where a well is being drilled by Joe Cornacher and H. C. Howard of Newcastle.

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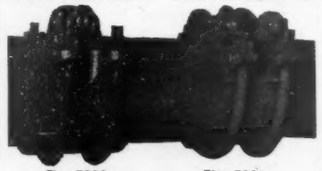

Fig. 7002 Fig. 7001

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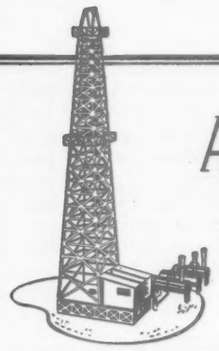

Among the Drilling

NOBLE Drilling Co., Ardmore, Okla., is moving heavy rotary to North Dakota where the company will drill Carter Oil Co.'s wildcat test in C SE SE 18-141-81w, northwest of Bismarck in Oliver County. Contract depth is 7,000 ft. In The Oil and Gas Journal of May 7, it was inadvertently reported that contract had been awarded to Manning & Martin, Inc., of Denver, Colo.

FITZPATRICK Drilling Co., Houston, Tex., spudded an 8,500-ft. contract well in De Witt County, Texas, for the Tide Water Associated Oil Co. et al on the F. G. Gibps farm, a Wilcox test 8 miles southwest of Yorktown, Tex.

ROTARY Drilling Co. is moving a rig to Live Oak County, Texas, for a 4,400-ft. wildcat test to be drilled for Brewer & Hixon on the F. W. Jones lease, south of Clareville, in Survey 271.

MANAHAN Drilling Co. received contract from Moore & Ahern, Houston, Tex., for 1 J. M. Heard, a wildcat in the Winston Survey, Jackson County, Texas.

ROWAN Drilling Co., Houston, Tex., is starting a new operation in the Danbury field, Brazoria County, Texas, where location was recently made for its 18 Jamison, H. Austin Survey 6.

JORDAN Drilling Co., Houston, Tex., has spudded a Wilcox test in the Livingston field, Polk County, Texas. The well is 1 I. B. Munson, and it is the first deep test to be drilled in the field which produces from the Cockfield sand at approximately 4,100-4,400 ft.

W. E. MASTERSON, Corpus Christi, Tex., is scheduled to let contract in the near future for a 7,000-ft. wildcat, 5 miles south of Robstown, Nueces County, Texas.

GEORGE ECHOLS, Houston, Tex., is attempting to open production from a new sand in the Westwego field, Jefferson Parish, Louisiana, where his 2 Marrero is being tested in sand at 10,400 ft. Meanwhile, preparations were being made to spud a projected deep test at the Napoleonville dome, Assumption Parish, Louisiana.

BREWSTER-BARTLE Drilling Co., Houston, Tex., received contract from Ohio Oil Co. for 1 E. L. McDonald, a projected 8,500-ft. wildcat test about 2 miles north of Bay City, Matagorda County, Texas. In the meantime, Quintana 1 Kostroun, a Wilcox test being drilled by the same contractor in La Salle County, Texas, is coring below 4,700 ft.

GROOVER & ROSE, Albany, Tex., are drilling Fleming Oil Co. 4 Corbett, Section 2, S.P. Survey, eastern Stephens County, Texas, one of two active operations in the Corbett pool. The company also drilled Callihan County's first deep prospect of the year, Don Dansby 1 W. A. Ramsey, a wildcat 3½ miles northeast of Putnam, Tex., and has started a west-edge test in Jones County, Texas, at the Stith pool for Danciger Oil & Refineries 1 A. J. Canon.

GEORGE P. LIVERMORE, Lubbock, Tex., has the contract and was moving in a rig from Broderick & Calvert and Livermore 1 Wilson Bryant, Midland County, Texas, wildcat, to drill Ed McAdams et al 1 W. D. Johnson, Jr., a scheduled 8,000-ft. wildcat in Borden County, West Texas. The Midland County test remained shut down for orders in black shale and sand at 6,104 ft.

SIEMONEIT Drilling Co., Fort Worth, Tex., had the drill site for Siemoneit 1 University-Texas, likely discovery in Andrews County, Texas, assigned to them for drilling the well on a farmout to Henry A. Roach from the Texas Co. The well was testing possible pays last week.

T. F. HUNTER, Wichita Falls, Tex., is contractor for the Jordan dan Petroleum Co.'s 3,100-ft. test on a block in the Fayette County School land, 15 miles southeast of Seymour in Baylor County, Texas.

DIXIE Drilling Co. (Grady Vaughn and H. W. Klein), Dallas, Tex., have taken the contract to drill a new well for Atlantic Refining Co. in the Neale field, Beauregard Parish, Louisiana.

BOSWORTH Drilling Co., Odessa, Tex., is drilling Gulf Oil Co. 31 Henderson, in the Waddell pool, northern Crane County, Texas.

FRANK WOOD, Wichita Falls, Tex., has the contract for Texas Co. 5-F Mallett, on the southwest end of the Slaughter field in Cochran County, West Texas.

READING & BATES, Inc., Tulsa, have the contract at Gulf and Lew Wentz 3 L. H. Miller, ½ mile northwest of the 2 Millar, Ordovician discovery in Pecos County, West Texas, and are drilling below 2,830 ft.

JOE TRIGG has the contract for Anderson-Prichard Oil Corp. 1 Leachman, in NE SE NW of 14-17n-1w, Logan County, Oklahoma, which last week was drilling at 1,257 ft.

PENROD Drilling Co. has the contract for Arkansas Fuel Oil Co. 1 Maxwell, SE NW 25-9n-1e, at Little Creek, La Salle Parish, Louisiana. The test has started.

J. J. ROBERTS, Shreveport, La., has the contract for Arkansas Fuel Oil Co. 1 Merritt, in SW of 13-17n-7w, Bienville Parish, Louisiana, a wildcat test.

BASS & DILLARD, Wichita Falls, Tex., are contractors for a new 6,000-ft. test in the new Spring area of Clay County, Texas. It will be Continental Oil Co. 3 Earl Spring, ¼ mile north of the discovery which was brought in last December.

Crew of H. & H. Drilling Co., at Oklahoma City. The men are: E. L. Hill, Fred McCollum, Joe Whitecotton, John Furbel, S. T. Hill, and Roy C. Smith

Contractors

ARROW Drilling Co. has contract for the drilling of Cities Service Oil Co. 1 Cavanaugh, in SW SW SW 2-15n-4w, southwestern Logan County, Oklahoma, which last week was drilling at 1,309 ft. in red sand and shale.

MABEE Drilling Co., which firm has the contract for Cities Service Oil Co. 1 Underwood, in SW SW SW of 11-15n-4w, Logan County, Oklahoma, was drilling last week at 705 ft. in red beds.

DELTA Drilling Co., Tyler, Tex., has sold a half interest in its properties in the Chapel Hill field of Smith County, Texas, to Sinclair Prairie Oil Co., Joe Zeppa, president, has disclosed. Properties include 900 acres of leases, with producing wells on some of the tracts, and a 40-mile pipe line from Chapel Hill to the East Texas area. Sinclair Prairie has taken over operation of all the properties.

WARREN & BRADSHAW Drilling Co., who are drilling Texas Co. 1 Yellow Fish, in SW NE SW of 20-5n-11w, near the Apache townsite in Oklahoma's Caddo County, drilled to 1,220 ft. and was reaming hole to set surface pipe. Warren & Bradshaw also has contract for Atlantic Refining Co. 1 Hamil, in C NE SW of 27-8-3e, south of the Brooksville, a new Hunton lime pool of Pottawatomie County, Oklahoma. Surface pipe has been set.

PARKER Drilling Co., drilling Amerada Petroleum Corp. 1 Smith, in C SE SW of 14-10n-13w, near Eakly, Caddo County, Oklahoma, was drilling at 1,460 ft. after setting surface pipe at 705 ft.

PENROD Drilling Co. has the contract for a test to be drilled by W. Hebert and Lamar Hunt, trustees, who have applied for permit to drill 1 A. B. Learned, in 18-6n-10e, 6 miles east of Ferriday, Concordia Parish, Louisiana.

FAIN Drilling Co., who has the contract for Stanolind Oil & Gas Co. 1 Buckner Orphans Home, Matagorda County, Texas, cleaned up a fishing job at 5,136 ft. and was drilling below 5,400 ft.

W. C. BRISCOE, Kilgore, Tex., drilling contractor, spudded and was drilling ahead below 1,530 ft. at a 4,500-ft. Wilcox sand wildcat, Coastal Refineries and E. B. LaRue 1 Henderson, John Watson Survey, 12 miles west of Lufkin, Angelina County, Texas, on a 9,000-acre block extending west into Houston County, and the firm will drill a second wildcat westward on Southern Pine Lumber Co. land in the C. W. Tier Survey.

C. E. DOZIER, Houston, Tex., has a contract to drill a 5,000-ft. test 2 miles south of Falls City, Tex., Capricorn Oil Co. 1 Moczygemba, which was spudded in last week and at the week's close was setting about 200 ft. of surface casing. Hard surface rock made drilling slow for the first depth. The test is said to be one of the most important wildcats in South Texas at this time.

CROW Drilling Co., Shreveport, La., has the contract for Ward Delaney 1 Taylor, a Travis Peak wildcat located in the C SW NE of 12-19-1e, Union Parish, Louisiana. The test will be taken to the 5,100-ft. level and spudding was anticipated early this week.

BIG CHIEF Drilling Co. has four rotaries running in the Illinois basin area. Bill Payne left Oklahoma City for Salem last week.

JOE TRIGG, drilling contractor of Oklahoma City, Okla., has contract for Lario Oil & Gas Co. wildcat in NE SW of 15-17s-17w, northwest of the Bison pool in Rush County, Kansas.

OLSON Drilling Co., Tulsa, and Associates 1 Helena National Bank, located in C SE SE of 12-24-11w, Alfalfa County, Oklahoma, is a rank wildcat test on the McWillie structure in the southern part of the county, 24 miles south of the Kansas line. The contract calls for a test well to 7,400 ft., or the Simpson-Wilcox sand series.

GLASSELL Drilling Co., Shreveport, La., has the contract for Continental Oil Co. 1 Watts, in 40-15-13e, a wildcat test in Madison Parish, Louisiana.

BERBOW & BRITTON Drilling Co. has contract for a 3,500-ft. wildcat test for Jordan Petroleum and Checkerboard Royalties, Inc., 1 Hart, in NE NE NE of 24-5n-26w, west of Vinson in northern Harmon County, Oklahoma. A good show of oil in dolomitic lime at 2,983 to 3,000 ft. is reported. Work was shut down early this week pending return from Houston of Eugene Jordan. Operators will probably make a drill-stem test.

ARROW Drilling Co., drilling Gulf Oil Corp. 1 Scurch in the Apache field of Oklahoma's Caddo County, reached 3,861 ft., where test was made, through a $\frac{1}{4}$-in. choke on tubing. The test flowed 513 bbl. in 24 hours.

FAIN-PORTER Drilling Co., drilling Cities Service Oil Co. 1 Ke-har-to, on the south tip of the Apache field, Caddo County, Oklahoma, was washing in for the company's first production in the field. The well was drilled to 4,015 ft. to show water, was plugged back to 3,976 ft., and casing was set at 3,912 ft.

Crew of Smith Brothers, drilling contractors, at Brooksville, Okla. The men are: Clyde Dunham; H. K. Hutchins, of Tonkawa Bit Shop. Speedy Wilcox; Selta Richardson, of R. C. H. Construction Co.; Price Smith, coowner of Smith Brothers; Donald Bodard, and L. O. Holloway

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Personal Paragraphs

O. M. (TED) EVANS, production engineer for Skelly Oil Co., Tulsa, has been transferred from Tulsa to the Pacific Western Oil Co.'s Los Angeles, Calif., office.

FRANK A. STACY, independent oil operator in the Midland, Tex., area, has been commissioned a major in the U. S. Army and will be director of athletic and physical education programs. Mr. Stacy is well known as a golfer and an all-around college athlete.

JERRY SADLER, Texas railroad commissioner, has volunteered to become a private in the Army.

L. B. (BUD) MERRILL, land man for Glacier Production Co. since 1932, has announced his resignation, and has gone to Portland, Ore., to engage in war work.

ALBERT CLINKSCALE, exgeologist of Oklahoma City, Okla., has been promoted to major in the Air Corps and is an instructor in administration at Miami Beach, Fla.

JOE E. EATON, Los Angeles consulting geologist of many years, and an aviator in World War I, has reenlisted and is now a major. He has received orders to report for Air Corps service and may be flying again soon.

A. T. JERGINS, president of Jergins Oil Co., independent producing company, will buy a pair of hiking boots if Los Angeles police do not find his stolen automobile soon. The car had good rubber and black-out lights and Al hopes they leave the rubber.

VERNE F. FUSON, for the past 4½ months head of the land, lease and geological department of the British American Oil Producing Co. in the North Texas division, Wichita Falls, Tex., left last week for Evansville, Ind., where the company has opened a new division. He will take charge of the new offices.

L. W. BENNETT, treasurer of Sunray Oil Co. and associated with the company since 1930, was elected a director of the corporation at the annual meeting of the board of directors. He fills a vacancy caused by the resignation of WILLIAM G. JOHNSTON, Oklahoma City and Houston oil man, who has entered war work.

WENDELL B. FARRIS, Vancouver, B. C., a director of Home Oil Co., has been appointed chief justice of British Columbia.

CAPT. MICHEL T. HALBOUTY, formerly consulting geologist and petroleum engineer, Houston, Tex., returned last week from Fort Benning, Ga., where he was a member of the graduating class in the advanced battalion commander and staff officers' course. Mr. Halbouty was scheduled to return to Fort Benning as an instructor.

G. HARRISON SMITH, president of Imperial Oil, Ltd., has been elected president of Dalhousie Oil Co., Calgary, Alta. Others officers are: Vice president, ALEXANDER HANNAH; secretary-treasurer, R. D. MERCER, and directors, J. H. McLEOD, A. C. NEWTON, C. S. McKENZIE and S. F. HEARD. Mr. McLeod has also been elected president of Southwest Petroleum Co., of Calgary, Alta.

Announcement was made last week by RALPH B. ROARK, vice president in charge of the Mid-Continent area for Shell Oil Co., Inc., of recent changes resulting from key men entering service. E. A. BACON, manager of crude-oil purchases, has been ordered to report as a major to the chief of ordnance at Washington, D. C.; W. B. CASE, formerly in Tulsa and for some time at the New York City office, has been ordered to Tulsa as acting crude-oil-purchases manager, to be assisted by C. A. NYHOF, another former Tulsan who has been transferred from Houston, Tex. Mr. Nyhoff succeeds L. R. BAIRD, who has also gone into the Army. C. BROOKS PIERCE, a member of the geological staff of the Oklahoma area, has gone to Miami Beach, Fla., for assignment as a second lieutenant in the Air Corps.

REX COFFEY, land man for many years at Enid, Okla., for Magnolia Petroleum Co., is now at Alexandria, La., following closing of the Enid office.

ROBERT A. ARNOLD, of Cushing, Okla., has joined the Kansas staff of Champlin Refining Co., and will be stationed at Wichita and Medicine Lodge.

GEORGE S. COREY, assistant geologist in the West Texas district at Midland for Shell Oil Co., Inc., has joined the U. S. Army Air Corps and will enter training at once at Miami Beach, Fla.

ROBERT WEBB COGHILL has left the Cooper Petroleum Co., Houston, Tex., to become petroleum analyst of the staff of the Board of Economic Warfare in Washington, D. C.

TORKILD RIEBER, former chairman of the board of the Texas Co., has been elected president of the Barber Asphalt Corp. He succeeds FRANK SEAMANS, who had been with the company for more than 50 years.

W. W. McILROY of Amarillo, Tex., has been named president of the Panhandle Producers and Royalty Owners Association. R. C. KAY, Amarillo, is vice president; E. L. GREEN, Pampa, is treasurer, and G. H. McGRATH, Amarillo, is secretary.

JOSEPH BENTON, Standard Oil Co. of California construction superintendent, and his wife arrived in California from Palembang, Netherlands East Indies, via Australia and other points. Mr. Benton reports that the Japs "will find only desolation and burned earth in the Dutch Indies." They left Palembang on less than 1 hour's notice on February 15.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

California oil producers are very properly asking the Government what it is going to do to relieve the ever-growing shortage of fuel oil in that state. The shortage is now increasing at the rate of a million barrels a month.

The Mexican Government denies that it intends to take over the oil properties of the Pearsons and others and operate them under governmental control. The Mexican Government has troubles enough with Villa and a few other brigands without courting further annoyance.

20 YEARS AGO

F. L. Doheny, president of the Pan American Petroleum Co., Los Angeles, Calif., has recently purchased the 116-acre lease in 1-31-24, of the Elk Hills field, for approximately 3 million dollars.

T. H. Barton and J. B. Sowell announce that the Natural Gas & Petroleum Co., a new Delaware concern with 3 million dollars capital, will take over the El Dorado Natural Gas Co. and the firm of Coats, Sowell & Barton, both operating in El Dorado, Ark.

W. L. Mellon, president of Gulf Oil Corp., is said to have denied absolutely that Gulf would sell out to Standard Oil Co. of Indiana. It has been reported in financial circles that the latter company would take over the Gulf corporation on a basis of five shares of Standard of Indiana stock for one of Gulf's.

10 YEARS AGO

E. I. Hanlon, chairman, and D. E. Buchanan, president, of Hanlon-Buchanan, Inc., Tulsa, spent the past week in New Orleans going over plans for enlargement of the company's natural-gasoline stabilizing plant at Good Hope, La.

W. S. Farish, president, Humble Oil & Refining Co., in an address before the convention of the United States Chamber of Commerce, in San Francisco, Calif., said that control of output must come, and that unified operation should displace unrestricted competition.

W. G. SKELLY has been reelected president of the Mission Corp., which owns a majority interest in Skelly Oil Co. and a substantial interest in Tide Water Associated Oil Co.

L. M. HENDERSON, of Pure Oil Co., has been elected first vice chairman of the Chicago, Ill., section of the American Chemical Society, and T. H. ROGERS, Standard Oil Co. (Indiana), has been elected second vice chairman.

REESE H. TAYLOR, president of Union Oil Co., with headquarters in Los Angeles, Calif., and former president of Consolidated Steel Corp., according to reliable sources, will be drafted for Washington service in the iron and steel branch of the War Production Board within the next few days.

LUTHER WILLIAMS, editor of the Diamond, house organ for the Mid-Continent Petroleum Corp., Tulsa, has been elected vice president of the National Council of Industrial Editors Association, which met in Chicago last week and awarded the Diamond a certificate of merit for editorial excellence.

E. CLIFFORD WILLIAMS, former vice president and director of research of the Shell Development Co., was awarded the American Institute of Chemical Engineers 1942 William H. Walker Medal for an outstanding contribution to chemical engineering literature, a paper on synthetic glycerin manufacture. Mr. Williams has since taken a position with General Mills, Inc.

R. L. BOSWORTH has been elected treasurer of Continental Oil Co., of Ponca City, Okla., succeeding GEORGE F. SMITH, who has been vice president and treasurer, and who will continue as vice president to handle increased administrative duties imposed by changed policies to meet war conditions. Mr. Bosworth has been Continental's New York office manager for the past 9 years. GEORGE JUREMEV has been named assistant secretary and assistant treasurer of the company.

Receives Hanlon Award

Edwin Oliver Bennett, better known to his friends as Ed, last week was the recipient of the Hanlon Award, granted annually by the Natural Gasoline Association of America for meritorious contributions to the industry. Presentation was made at the annual banquet of the association, at the conclusion of its convention in Tulsa.

EDWIN OLIVER BENNETT

Mr. Bennett is a product of California, of which he is a native son and in whose Stanford University he received his technical training. He worked his way through the university, and for the duration of the first World War, he was in Washington, D. C., as technical adviser with the National Advisory Committee for Aeronautics. Afterwards, he returned to California, and moved into production, gas and gasoline work with Standard Oil Co. of California. His first work in connection with the design and construction of natural-gasoline plants was in 1919 shortly after the discovery of the Elk Hills field. His work at that time was on compression and refrigeration.

He served for a while with the U. S. Bureau of Mines at Bartlesville, Okla., where he made important contributions to the industry. He is best known to the natural-gasoline industry for his work in high-pressure gas and gasoline operations. It was his guiding genius that resulted in the design, construction, and operation of the high-pressure gasoline plants which his company operates. These plants are designed for the purpose of taking from the reservoir the ultimate hydrocarbon content, both oil and gas, while maintaining the reservoir pressure at maximum efficiency.

Mr. Bennett was formerly chief petroleum engineer and later chief engineer for the old Marland Oil Co., and when it lost its identity and became a part of Continental Oil Co., he was made assistant manager of production and later chief petroleum engineer for that company, a position he now holds.

L. L. LIVINGSTON, with J. H. Tatlock organization, was elected president of the Petroleum Accountants Society of Kansas last week, succeeding I. A. LANGE, Wichita.

CHARLES R. HOUSIERRE, geologist and scout for Kirby Petroleum Co., Jackson, Miss., has left to join the Naval Reserve. He will be stationed at Long Beach, Calif., for the time being.

FRANK PHILLIPS, chairman of the board of Phillips Petroleum Co., Bartlesville, Okla., was honored by the Boy Scouts of America last week when the national council of the organization presented him with the Award of the Silver Buffalo.

J. H. TUTTLE, vice president of Standard Oil Co. of California with offices in San Francisco, has been elected a member of the board of directors of the California State Chamber of Commerce. S. M. HASKINS, Los Angeles, Calif., a member of the board of Union Oil Co., has been elected a member of the board of the chamber.

HARRY N. GREIS, president of Deep Rock Oil Co., Tulsa, has awarded 25-year service emblems to five Deep Rock men. They are BARNEY L. MAJEWSKI, vice president in charge of marketing; O. O. KERR, treasurer and secretary; W. E. MOODY, vice president in charge of refining; GEORGE G. ARMSTRONG, JR., of Minneapolis, Minn., and THOMAS L. GALLAGHER, Cushing, Okla.

R. R. HOBSON last week rounded out his fortieth year with Houston Oil Co. of Texas. He was to be presented with a special service award at the company's annual picnic Thursday of this week. GEORGE A. HILL, JR., president of the company, was to make the award. Mr. Hobson started with Houston Oil Co. in 1902, distributing oil-field materials with teams in Beaumont. In 1932 he was named general manager, which position he now holds. In 1940 he was elected a director of the company.

A. C. SIMMONS, of Bradford, Pa., has been elected president of the Bradford Oil Producers Association, succeeding HUGH GRANT, also of Bradford. Named with Mr. Simmons as officers were: J. PAUL JONES, Bradford, first vice president; JOHN BRYNER, Custer City, Pa., second vice president: G. H. DAGGETT, Bradford, secretary-treasurer.

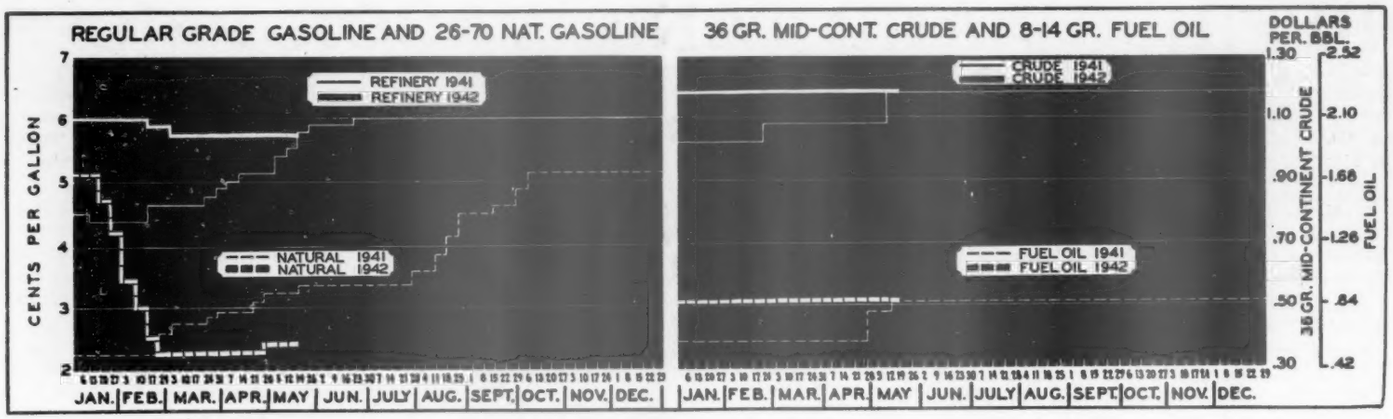
Shifts: E. G. FRY, JR., engineer, Fry Exploration Co., Denver, Colo., to Aubuquerque, N. M.; L. D. LOGAN, engineer, Texas-Empire Pipe Line Co., Pana, Ill., to Lowry, Mo.; M. W. FORMAN, engineer, Phillips Petroleum Co., Kansas City, Kans., to Bartlesville, Okla.; E. C. HINES, engineer, Stanolind Pipe Line Co., Granger, Wyo., to Oklahoma City, Okla.; W. R. ZWINK, engineer, Cities Service Oil Co., Oklahoma City, Okla., to Loup, Neb.; R. S. POWERS, engineer, Oklahoma Pipe Line Co., St. Elmo, Ill., to Tulsa; JOHN I. SHAW, Shaw & Co., Inc., Chicago to Washington, D. C.; GEORGE S. WALDEN, Standard Vacuum Oil Co., New York City to London, England; W. B. ALEXANDER, superintendent, Zephyr Drilling Co., Ada, Okla., to San Francisco, Calif.; N. F. JONES, engineer, Oklahoma Pipe Line Co., St. Elmo, Ill., to Tulsa.

KENNETH S. FERGUSON, district geologist for Shell Oil Co., Inc.; E. A. WAHLSTROM, chairman of the Goldsmith pool engineering committee, and C. D. VERTREES, district geologist for Continental Oil Co., all of Midland, Tex., are a committee of the Permian Basin Engineers and the West Texas Geological Society, formed to be of service to all technically trained men in West Texas and New Mexico in finding places where they can be of service in the armed forces.

JOHN W. HEMPHILL, engineer in charge of the Glenn Pool repressuring project for Sinclair Prairie Oil Co., was sworn in last week as lieutenant junior grade in the U. S. Navy.

JOSEPH J. BENTON, construction superintendent for Standard-Vacuum Oil Co. in the Dutch East Indies, who assisted in destroying oil fields and plants at Sumatra just a few hours before the Japanese invasion, is visiting in Houston, Tex.

Promotion for JOHN A. NICHOLS, district land man for Texas Co. at Midland, Tex., to special lease man at the division office in Fort Worth, Tex., has been announced. He has been succeeded at Midland by E. W. STATTON, who was transferred from Fort Worth. In the point of service, Mr. Nichols is one of the oldest major-oil-company representatives in the West Texas area.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK. — In view of the unexpectedly heavy demand for "X" cards which entitle the holders to unlimited supplies of gasoline and for "B" cards, each providing from 33 to 57 gal. during the May 15-July 1 rationing period, larger than anticipated demands for gasoline are expected during the 6 weeks. Potential results of this development are a possible reduction in the size of the present basic unit, 3 gal., or the inability of service stations, now operating under a 50 per cent restriction of deliveries, to supply requirements. Supplies at many stations were completely exhausted as motorists filled tanks prior to the rationing period.

Recent estimates of basic East Coast petroleum requirements place the total at 1,265,000 bbl. per day after eliminating all but the most essential needs. This assumes a 60 per cent reduction in average gasoline consumption, and 20 per cent in fuel oil. Obviously the 60 per cent gasoline reduction will not be attained unless more rigid restrictions than those resulting from the issuance of many X and B cards are effected.

Even after the 60 per cent gasoline consumption cut is effected, an increase of more than 25 per cent in deliveries to District 1 will be required to bring supply into line with demand. These deliveries totaled slightly more than 1,000,000 bbl. per day in the week ended May 9. They were composed of 163,466 bbl. via tanker; 650,256 bbl. via tank cars; 125,514 bbl. by pipe lines and 64,056 bbl. in barges. Another 150,000-bbl. increase in tank-car shipments which would lift them to their projected peak of 800,000 bbl. and which is unlikely to be attained within 6 weeks would be insufficient. Since no other resort, with the exception of the resumption of coastwise tanker shipments, could effect the necessary increase, it is now regarded as probable that a further tightening of restrictions is in prospect.

Mid-Continent

TONE of the refinery market in the Mid-Continent and Middle West improved this week but prices are static at previous levels. There appeared to be less material offered on the open market at distress quotations from the scattered suppliers which have been a factor in trading for the past 2 months.

Fuel oils are tight and trading is predicated on a more cautious basis since inclusion of 15 midwestern states in the restricted area. Curbs imposed so far by the War Production Board apply to the Middle West only in the case of deliveries to new installations. Refiners, however, regard the development with certain misgiving. They remember that first restrictive measures on the East Coast followed somewhat the same mild pattern at the beginning. Distributors are receiving calls from retail customers now that ordinarily would not develop until the early fall months and this unusual type of business has taken out what little slack previously existed in quotations.

Motor fuel is moving to the limit of transportation facilities between refinery centers in the Mid-Continent and consuming districts throughout the eastern part of the country. Shipments to the East Coast continue although the institution of direct consumer rationing may tend to diminish the call from interior sources.

Transportation facilities previously used for delivering motor fuel, however, will be diverted to hauling burning oils into the shortage states in an effort to build up stocks in those eastern areas during the summer lull of consumption.

Mid-Continent refiners report that Texas operators are likely to push products more vigorously into the interior market under the liberal allowable order prevailing during the current month, although transportation costs are a curbing factor which may prevent indiscriminate raids on the normal marketing territories.

SENTENCE SUMMARIES

MID-CONTINENT: Tone of market improving. Gasoline call steady, fuel oils in brisk demand. Distress materials diminished.

EAST COAST: Confusion follows institution of rationing. Supply situation continues critical, particularly on fuels.

GULF COAST: Limited movement reported. Tank-car shipments keep strain off fuel oils.

PENNSYLVANIA: Stocks are diminished at refineries. Most products are moving to extent of current refinery production.

PACIFIC COAST: Fuel oils feature trading. Stricter rationing in Pacific Northwest ordered June 1.

A.P.I. REFINERY REPORT

Week Ended May 9, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
Appalachian	156	4,089	651	428
Ind., Ill., Ky.	709	21,265	3,552	2,755
Okla., Kans., Mo.	365	9,779	1,598	879
Censored group*	1,506	45,600	16,040	13,943
Rockies	80	2,478	510	310
California	590	17,439	57,804	11,632
Total May 9, 1942	3,406	100,650	80,155	29,947
Total May 2, 1942	3,441	101,376	79,939	29,638
Total May 10, 1941	3,876	95,150	92,156	33,284

Note: Refinery runs and stocks for week ended May 16, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
May 9, 1942	255,185,000
May 2, 1942	259,145,000
May 10, 1941	263,994,000

*Excludes heavy, unrefinable stocks in California.

Gulf Coast

HOUSTON, Tex. — There was no improvement in the Gulf Coast refinery markets this week. While there was good demand for material, sales were small due to limited transportation facilities. Tankers remained in port and there is little likelihood that shipping will resume soon as additional merchant ships were sunk by submarine activity in the Gulf of Mexico.

In the meantime, refiners continued to operate at reduced capacity and the storage situation at many plants is acute. American Republics' 6,500-bbl. plant on the Houston Ship Channel was temporarily closed down May 1 due to lack of storage facilities.

Kerosene was slightly easier with quotations unchanged. Fuel oils continued strong with stocks limited.

Pacific Coast

LOS ANGELES, Calif.—No distress gasoline appeared on the market this week with the result that conditions were fairly stable.

Fuel oil continued in good demand and there is every reason to believe that marketers will be pressed to meet anticipated requirements later this year.

Diesel and gas oil are moving at unchanged prices and are being used as blending stocks with heavy fuel oil to meet Navy specifications.

Independent refiners are feeling the pinch with prices pegged on many commodities. This has forced a number of small refiners to consolidate operations and this group hopes to survive impending conditions. There is not enough differential between crude oil and refined oil to permit satisfactory operations. This is especially true with respect to fuel oil. Declining demand for gasoline at independent stations, especially those in rural sections, is being felt by small refiners and the number of stations closing each week is growing. It is estimated that 500 stations on the Pacific Coast have been closed since the present unsettled situation arose.

REFINERY AND TANK-WAGON PRICES

(Prices as of May 19)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.500-5.625	.....	5.125-5.250	4.750-4.875
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.700	.....	.....	9.200	9.200	.....	.....
Pacific Coast	.....	6.500-6.750	6.125-6.250	6.250-6.500	5.750-6.250	5.25-5.50	4.75-5.00

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.375	2.750-2.875	.....
North Texas	2.000	2.375-2.500	.....
North Louisiana	2.125	2.500-2.625	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500
Northeast Coast	.....	.....	.....	5.700	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	5.800	2.222	1.80
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	.....
Northeast Coast	5.8	5.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	$0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
400	15.00	16.00
650	15.50	16.50
400 flash	16.00	17.50
650 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		38.50
Zero pour point		37.50
10 pour point		36.50
15 pour point		31.00
25 pour point		
200 vis., at 70° F., 3 color:		40.50
Zero pour point		39.50
10 pour point		38.50
15 pour point		33.00
25 pour point		
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		6.250
133-135 (A.m.p.) wax		6.550
Crude scale:		
124-126 (A.m.p) w.s.		4.350-4.455
124-126 (A.m.p.) y.s.		4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene 41-43	Diesel fuel 24 G.	Diesel fuel 48-52 D.I.	Diesel fuel 58 D.I.	Diesel fuel Bunkers	Bunker C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-85
Pacific Coast	4.750-5.000	1.25-30	.....	.....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils 200-3	Neutral oils 150-3	Bright and cylinder stocks 200-3	Bright and cylinder stocks 150-3	Bright and cylinder stocks 600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Baltimore, Md.	15.05	5.50	9.10
Boston, Mass.	14.50	4.50	8.40
Burlington, Vt.	16.50	5.50	...
Buffalo, N. Y.	15.80	5.50	9.20
Dover, Del.	16.30	5.50	10.80
Hartford, Conn.	15.20	4.50	...
Manchester, N. H.	16.90	5.50	9.40
Newark, N. J.	14.30	4.50	8.30
New York, N. Y.	15.70	5.50	8.40
Philadelphia, Pa.	15.80	5.50	10.55
Pittsburgh, Pa.	16.30	5.50	10.90
Portland, Me.	15.90	5.50	8.50
Providence, R. I.	14.60	4.50	8.20
Washington, D. C.	14.30	3.50	9.60
Average 14 cities	15.51	5.07	9.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Atlanta, Ga.	19.00	7.50	9.40
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.55	7.50	...
Charleston, W. Va.	18.85	6.50	11.90
Charlotte, N. C.	19.70	7.50	9.90
Jacksonville, Fla.	19.00	8.50	8.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	17.05	6.50	10.60
Average 11 cities	18.34	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kerosene tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.53	5.96	10.30
Average last week	16.57	5.96	10.30

Canadian Fields

(Continued from Page 85)

from the outcrops, the oil may be lighter, and may prove recoverable by the Ranney process of sinking shafts and driving horizontal tunnels, the oil flowing by gravity to the bottom of a shaft, whence it can be pumped to the surface. The aggregate oil content of the deposits has been estimated at 100 billion barrels, but development has heretofore been held back by the costs of transporting the product to markets.

Antelope Hills Test

Alliance Oils of Calgary has located a wildcat test in the Antelope Hills area, close to the Alberta-Saskatchewan boundary and about 18 miles south of Empress, Alta. Location is LSD 15, 19-20-1w4, and Alberta Drilling Co. of Calgary has the contract. The company holds 1,000 acres east of the Antelope Hills, on which there have been good geological reports.

Drilling at Castor

Shell Explorations, Ltd., has made tentative location for its first Alberta test in the Castor area, in SW 28-37-14w4. The area is in eastern Alberta, east and considerably north of the Tilley field. Drilling equipment is being brought from California and work will be started in the spring.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	3.00

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

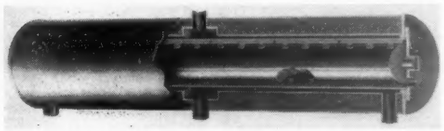
Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	...	...	...
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	...	1.07	1.30	.94
32-32.9	...	1.09	1.32	.96
33-33.9	...	1.11	1.34	.98
34-34.9	...	1.13	1.36	1.00
35-35.9	...	1.15	1.38	1.02
36-36.9	...	1.17	1.40	1.04
37-37.9	...	1.19	1.42	1.06
38-38.9	...	1.21	1.44	1.08
39-39.9	...	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

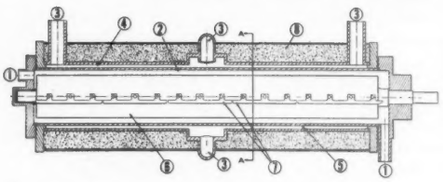
*Includes Lea County, New Mexico.

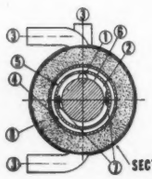
EQUIPMENT PROGRESS...

Continuous Closed-Type Heat-Transfer Mechanism by Girdler

A highly efficient, continuous, closed type of heat transfer mechanism for liquids and viscous materials, known as the Votator, has been employed heretofore







as an integral part of complete processing equipment manufactured by the Girdler Corp., Louisville, Ky., for a special group of industries.

The unique basic features of the Votator are continuous operation under pressure in a closed system, and extremely rapid rate of heat transfer. The latter features results from the high ratio of heat transfer surface to volume of material. These patented principles are illustrated in the accompanying drawings.

One illustration shows a cutaway view of the entire unit. The diagrammatic drawings show both horizontal and end cross-sections.

With only a thin wall separating the product from the heat-transfer medium, the rate of heat transfer is extremely fast. The action of the revolving scraper blades quickly removes the film from the wall, thus continuously exposing the heat-transfer surface to the incoming product.

This feature of high ratio of heat-transfer surface to volume, and the continuous, closed operation of the mechanism, offer many important advantages.

The process makes it possible to get extremely high K value, uniform temperature throughout the product and accurate temperature control. The high ratio of surface to volume permits change in temperature of the product through a wide range in the shortest possible time—usually a matter of a few seconds. The heat transfer is so rapid that many products can be supercooled well below the crystallization point and discharged from the unit in a liquid state. The scraping and mixing action of the blades assures uniform temperature change in the product as it progresses through the annular space between the mutator shaft and the heat-transfer tube.

Products may be heated or cooled without contacting with the atmosphere, due to the fully enclosed design of the unit. Conversely, predetermined amounts of gas may be incorporated into the product.

The unit can also be used to make a uniform mixture or to emulsify a mixture of products while the temperature is being changed.

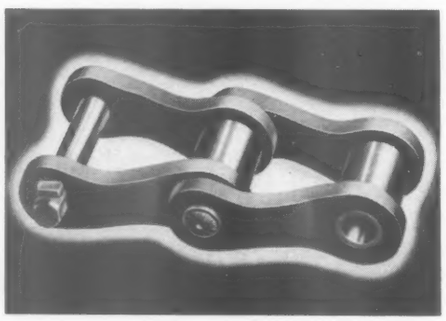
Low-temperature refrigerants or high-temperature steam can be used in the unit for the heat-transfer medium. The metal jacket surrounding the heat-transfer medium is heavily insulated, and the entire tube assembly is protected by a substantial metal cover.

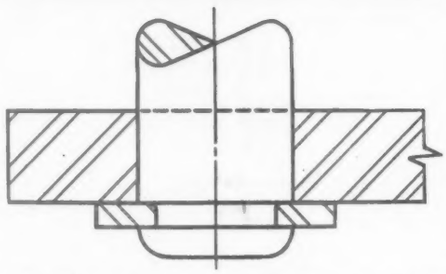
As indicated in the diagrams, the arrangement of the connections for the product and for the medium permit varied piping hookups, so that the mechanism can be incorporated into virtually any flow system.

Multiple assemblies, as shown in the accompanying flow diagram, may be used for both heating and cooling the product in a few seconds. The company is prepared to produce the mechanism in standard sizes and designs to fit the needs of many processes that warrant production on a quantity basis—as well as to meet certain requirements that may call for individually engineered units.

New Chain-Belt Development

A new riveted-type chain belt which because of its unique design offers a maximum in service, economy, and long life, has been announced by Chain Belt Co., 1600 West Bruce Street, Milwaukee, Wis. It has the features previously found in cottered Rex oil-field chain belt but does away with one of the major objections to the cottered type. That is, occasionally the cotters work loose and obstructions to the motion of the drive will sometimes shear them off. Naturally, shorter working life and higher chain costs result. Rex riveted chain belt overcomes this fault and still retains the great advantage of cottered chain which is ease of disassembly and assembly in the field.



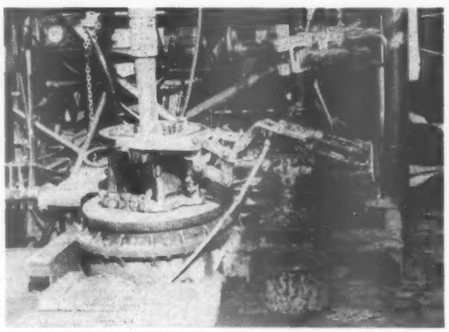


An illustration shows a cross-section of the new riveted head in the sidebar. The pin is riveted over a medium-hard washer which can be sheared by sledging in much the same manner as cotters. The washer is sledged through; the pin, which incorporates the principles of the Rex three-diameter pin, is loosened by driving it the depth of a single sidebar; and the chain is easily taken apart. Because of this construction, the rivet head can be made small enough so that when driven out through the washer, it cannot score the sidebar hole or the inner surface of the bushing. Thus, the sidebars are not destroyed as is the case in taking down other types of riveted chain. This factor alone results in the saving of one entire link of chain belt—which is as much as one-third of a foot.

Another illustration shows a two-link sample of Rex Deepwell A.P.I. 4, showing the new riveted design. This new riveted chain belt is also made in the other Deepwell size—A.P.I. 3—and in Champion A.P.I. 3 and 4.

Air-Actuated Rotary Pipe Slips by Shaffer

A new type of air-actuated rotary pipe slips, as shown, is now being manufactured by Shaffer Specialty Co. of Tulsa. B. F. Kelley is the inventor of this



new tool, as well as the Shaffer Safety spinning-line cat head.

These new rotary pipe slips are actuated by air pressure, thus eliminating the hazard of manually handling the slips. When air pressure is not available on rig, the slips may be manually operated by extended hand lever. Provision is also made to set the slips in case of rig accident, thereby removing possibility of dropping the pipe. A hand or foot-control device operates the air-actuated slips. The spider is arranged so it can be inserted in rotary table when kelly bushings are removed, and remain in the table while making trips.

The tool permits faster operation, results in saving of crew time, and affords the important safety features mentioned.

Navy "E" Awarded Crane Packing Co.

In company with other leading defense manufacturers throughout America, Crane Packing Co. is the first in its industry to be awarded the coveted Navy "E" honor by Secretary of the Navy Frank Knox, for production achievement and its high record for shipping Navy materials on schedule. The Crane company has been a Navy contractor for more than 20 years. In addition to the marine services, John Crane packings are broadly distributed throughout the industrial, chemical, and petroleum world.

TRADE LITERATURE

GIRDLER CORP., Louisville, Ky. — A new booklet which describes a unique and highly efficient mechanism for heating or cooling of liquids and viscous materials, which also offers mixing, emulsifying or aerating simultaneous with heating or cooling. The booklet is attractively printed and is illustrated with flow diagrams and reference tables.

GENERAL ELECTRIC CO., Schenectady, N. Y.—An 8-page folder, "How to Maintain D-C Motors." This folder gives the reader a different, new answer to the same old question. A feature of the folder is a trouble-correction chart, listing symptom, cause, remedy for the usual troubles encountered with direct-current mtors. The folder is copiously illustrated.

THE BRISTOL CO., Waterbury, Conn. — Bulletin P1102, describing newly developed line of Pyrovac Radiation Pyrometers. The folder gives theory of operation and information regarding the use of radiation pyrometers. It is liberally illustrated with engineering drawings showing methods of use.

AMONG EQUIPMENT MEN...

New Appointments Announced By Kobe, Inc.

Effective May 1, two new appointments were announced by C. M. Rader, general sales manager of Kobe, Inc. W. F. Slater, formerly district representative in charge of the company's activities in the Tulsa district, is California district manager, responsible for the company's sales and operatons in California; and J. J. Siegel is sales manager in charge of slotted pipe and prepack gravel liner sales in both the foreign and domestic markets. Both Mr. Slater and Mr. Siegel will headquarter in the company's Huntington Park offices.

J. J. SIEGEL

W. F. SLATER

Mr. Slater attended the engineering schools of Oklahoma University and Tulsa University, and after leaving school was for several years actively engaged in oil production. In 1936 he entered production work and was actively interested in engineering studies and pumping-equipment problems in the Mid-Continent fields. In 1941 he became associated with Kobe, Inc., as Tulsa district representative, a position he has held until his recent appointment and transfer to California.

Mr. Siegel has been actively engaged in the development of Kobe slotted pipe since the early days of the company; and, prior to joining Kobe, was associated with the pioneering of oxygen and acetylene apparatus on the Pacific Coast with such companies as California Burdett Oxygen Co. and California Compressed Gas Co. He has had a wide and varied experience in oil-well screening problems and is well equipped to assume the responsibilities of his new position.

Unit Rig Names Baird Export Representative

Unit Rig & Equipment Co., Tulsa, has announced the appointment of John H. Baird, 420 Lexington Avenue, New York City, as its export representative.

Formica Appoints Southwestern Representative

Ed Clark, a factory-trained specialist of Formica Insulation Co., Cincinnati, Ohio, has been appointed representative of the company in the Southwest and will specialize in servicing the users of the material in the industry. His address is 5701 Jackson, Houston, Tex.

Miller Heads Department of Pittsburgh Plate Glass Co.

R. W. Miller, who has been connected with Pittsburgh Plate Glass Co. for 12 years, has been appointed manager of the technical service department of the company's Columbia Chemical Division.

R. W. MILLER

Mr. Miller has been engaged in technical service activities since 1937, and succeeds Dr. G. L. Cunningham, who has resigned. He joined the company in 1930 after graduating at Pennsylvania State College.

After 3 years in the research department on pilot-plant operations and general investigation, Mr. Miller was assigned to study on the uses of calcium chloride in soils for engineering purposes. He was active in promoting the principles of soil stabilization, now recognized as an improved method of highway and airport runway construction. Since 1937 he has assisted customers in the application of alkalies and chlorine.

He is a member of the American Chemical Society; associate member of the Highway Research Board; National Research Council; and a member of three subcommittees in the American Society for Testing Materials. He represents the company in the American Water Works Association; Technical Association of Pulp and Paper Institute; American Pulp and Paper Mill Superintendents Association; and the Calcium Cchloride Association, technical committee.

Correction

Last week cutlines under two cuts were inadvertently transposed on these pages. The name Arthur Penick was printed under a cut of H. D. Start, and Mr. Start's name was printed under the cut of Mr. Penick. Both men are associated with the Oil Center Tool Co.

Approximately 70 members of the New York chapter of Nomads attended the annual open-house meeting in New York City, April 27. Also in attendance were nearly 100 guests, whose names are given below. The principal speaker of the evening was J. C. Rovensky, assistant coordinator of Inter-American Affairs. Guests attending the dinner were:

(Standard Oil Co. of New Jersey) G. M. Knebel, H. A. Muller, J. M. Sitler, Morgan Walker, E. W. Linscott, A. J. Kelly, J. R. Mansfield, Donald McIntyre, Walter Davies, R. E. Watson, G. H. White, and R. D. Moriarity. (Asiatic Petroleum Co.) William Jububek, T. G. Schad, W. S. Scheelje, Charles Staines, Michael Testa, R. Schider, C. F. Lunghard, Joseph Schneider, S. J. Veenstra, A. Nilsson, and E. F. Carney.

(Socony-Vacuum Oil Co., Inc.) Robert Siegel, Ben B. Cox, and J. T. Kilpatrick. (Gulf Oil Corp.) C. W. Hamilton, H. E. Slater, C. W. Woessner, and R. J. Macauley. (Standard Oil Development Co.) G. R. Weeks, H. D. Gibson, H. L. Kuhlken, and C. E. Paules. (Amtorg Trading Corp.) E. S. Sergeev, K. I. Lukashev, and M. M. Gousev. (Mene Grande Oil Co.) Chester Crebbs and Henry Riedell.

(Anglo-American Purchasing Commission) W. G. Foster, A. I. Carney, J. A. Lindsay, W. H. Busold, and Dr. E. N. Haque. (Standard-Vacuum Oil Co.) E. W. Berlin, F. W. Herrschaft, W. S. Lee, and D. Roehm. (Sinclair Refining Co.) Leland Stanford, J. A. Rudden, and J. A. Rubiano. (Argentine Government Oil Fields) C. T. Campodonico, J. Reca, P. J. Panza, and J. N. Catinari.

(Bahrein Petroleum Co.) W. M. Brown, G. W. Knoth, and D. G. Schnabel. (Anglo-Iranian Oil Co., Ltd.) S. W. Adey, R. G. Brown, J. M. Walsh, P. G. Allen, and H. Cartwright Reid. (Texas Co.) Harry Munster, A. H. Stepney, W. H. Borie, and J. P. McCulloch. (British Petroleum Commission) H. L. Wilkinson and James Park.

Also among the guests were: Leo Byrnes, California-Texas Oil Co.; P. H. Crago, Hughes & Co.; W. L. Ewart, Lago-Aruba; B. C. Kitchen, International Petroleum Co.; Arthur Marinan, Reed Roller Bit Co.; L. C. Boos, U. S. Rubber Co.; R. B. McCartney, Clark Brothers Co.; K. C. Sclater, Petroleum Engineer.

Edward Sheehan, General Electric Co.; L. M. Bound, Cities Service Co.; Max Capper, Trinidad Leaseholds, Ltd.; H. B. Powell, Caribbean Petroleum Co.; Harry Callahan, Union Carbide Co.; E. L. Trafford, Trinidad Leaseholds, Ltd.; Charles Stanfield, Guy E. Daniels Co.; O. D. Small, W-K-M Co., and C. W. Miller. N. E. Baker and E. M. Butterworth were present from the coordinator's office.

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Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock. Ark.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

EAST TEXAS 9,000 ft. Paluxy-Trinity sand wildcat. Quick bet for 10 to 50 for one. E. CROFT, PROCTOR, TEXAS.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

OIL INVESTMENT OPPORTUNITY $50.00 will buy oil lease on townsite lot or royalty spread large tract all near deep test well to drill in Hunt County, Texas, immediate future. If interested write Guy J. Stumpff Co., Box 23, Commerce, Texas.

OPERATORS: WE HAVE 4000 acres full geology and geophysical shows structure high developing R. M. area. Will farm or partly finance drill 3000 ft. Box A-984, The Oil and Gas Journal, Tulsa, Oklahoma.

MICHIGAN—1,160 ac. to lease for Oil and Gas. Map free. Owner: L. J. Meldrum, 8354 Epworth, Detroit, Mich.

FOR SALE: 10 acres Johnston Co., Okla. NW¼ of NW¼ of SE¼, Sec. 19, Twp. 2S, Range 8 East. Barry, 3505 Legation St., NW, Washington, D. C.

FOR LEASE or SALE: Lands in Bee, Refugio, Gaines and Deaf Smith Counties, Texas; Wagoner and Washita Counties, Okla. Spears Havely, Richmond, Va.

ECTOR CO. lease, 7 miles of Sealy-Smith Ordovician discovery well. ANDERSON, 1014 Cumberland, Dallas, Tex.

I HAVE good reasons to believe I have a good pool of oil under my farm. Wanted, someone with capital to drill and develop. E. B. Creasey, R.F.D., Dalton, Ky.

OIL PRODUCTION

Wanted responsible party or company to join in additional development of partly developed water repressuring property in proven shallow sand area Box B-102, The Oil and Gas Journal, Tulsa, Okla.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS, Box 5411, Philadelphia.

Situations Wanted

EXP. refinery operator can handle topping, crack. and treat. units. Box A-994, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Instrument and Electrician foreman, 11 years' experience, still operation, construction and maintenance. Factory trained on instruments. Age 30, resourceful, careful, energetic. Good references. Mid-west preferred. Box A-970, The Oil and Gas Journal, Tulsa, Okla.

OIL ACCOUNTANT: 12 years with present company as chief accountant. Experienced in Income Tax and all phases of Oil Business except Rfg. and Mktg. Age 37. Classification 3-A. Prefer to work in Mid-Continent area. Box B-104, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

DESIGNERS AND DRAFTSMEN

For vital war plant work carrying high priority ratings of A-1-A to A-1-C. Working 50 hours per week with remuneration on basis of a 40-hour week with time and one-half for work in excess of 40 hours per week. Program covers 1½ years. Must have experience in design of:

Oil Refinery Process Piping
Concrete and Structural Steel
Heat Exchangers, Pressure Vessels
Electrical Control, Light and Power Conduit Systems.
Instrument Engineers able to select and specify proper control instruments for oil refinery units.

Application should be made by letter giving age, nationality, concise outline of previous experience and educational background, present salary, salary desired and references. Include recent photograph.

BLAW-KNOX COMPANY
Process Industries Dept.
P. O. Box 5087
East Liberty Station, Pittsburgh, Pa.

REFINERY Maintenance Engineer, experienced in general refinery maintenance, design and construction. Must understand repair and cleaning of cracking units, internal combustion engines, and all types of pumping equipment. Box A-953, The Oil and Gas Journal, Tulsa, Okla.

INDEPENDENT refiner, who is now building plant to manufacture 100 octane aviation gasoline, requires the services of a petroleum engineer who has had experience in the operation and design of Thermal and Catalytic Cracking Reforming, Gas Recovery and Alkylation plants. In replying give education, qualifications and refining experience in detail; also salary expected. P. O. Box 1500, Corpus Christi, Texas.

Help Wanted

DESIGNERS AND DRAFTSMEN

For Oil Refinery work carrying high priority ratings of A-1-A and A-1-B under

Government Defense Program

Working 56 hours 3 weeks per month and 44 hours one week with time and one-half for work in excess of 40 hours per week.

Must have experience in design of:

Oil Refinery Process Piping, Concrete and Structural, Oil Heating Furnaces, Electrical Control and Light and Power Conduit Systems.

Can use several piping squad leaders. Must be thoroughly experienced on piping design and layout.

ARTHUR G. McKEE & COMPANY
Engineers & Contractors
OIL REFINERIES
BLAST FURNACES
STEEL PLANTS
2300 CHESTER AVENUE
CLEVELAND, OHIO

LARGE NEW YORK engineering firm requires chemical engineers age preferably 25-30 with any following experience:

1. Petroleum refinery experience in operation or design of stabilizers, absorbers and light end equipment.

2. Refinery experience in design or operation of plants for solvent dewaxing and solvent extraction of lube oils.

3. Refinery experience in design or operation thermal or catalytic cracking plants. In reply state education qualifications and refinery experience in detail. Also salary expected and status regarding military service.

Box A-972, The Oil and Gas Journal. Tulsa, Okla.

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Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.55*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

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1 Inch	*52 times*	*3.50 per inch*

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We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FOR SALE—Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea County, N. M., 27 pools in the county. Will sell in small interests. HARRY S. WRIGHT, FARMINGTON, NEW MEXICO.

Oil Industry Printing

OIL FIELD LEGAL BLANKS

Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Wanted

WANTED: Proven Oil production deals. $100,000 or more, no brokers.
M. R. TRAVIS
1702 S. Boulder. Ph. 2-2447, Tulsa, Okla.

Manufacturers' Agent

MANUFACTURERS' Representatives known to the best oil trade desired for quality specialties now being sold to the best oil field trade, repeat items, excellent commissions, exclusive territories open. Box A-983, The Oil and Gas Journal, Tulsa, Okla.

MANUFACTURERS Agent, 18 years representing first class line of specialties for drilling rigs, with Top Flight Contacts, Texas, Louisiana, and Arkansas. warehouse in Houston, interested in representing one or two reliable manufacturers of Drilling, Production, Refining, or Defense Equipment. Box A-993, The Oil and Gas Journal, Tulsa, Okla.

Incorporation

DELAWARE CHARTERS: **Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.**

Equipment Wanted

WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
(St. Clair County), Ill.

WANTED: 2 Ingersoll-Rand XOB Compressors. State size of cylinders and condition of compressors. Box A-980, The Oil and Gas Journal, Tulsa, Oklahoma.

WANT small portable rotary capable of 500' 6" hole, under $1000.00, also small swivel, hose, 4 x 5 or 4 x 6 pump, reply Box 254, Powell, Wyoming.

2—35,000-53,000 bbl. storage tanks.
2—1300' air compressors.
20—25 ton locomotive cranes.
R. C. STANHOPE, INC.
60 E. 42nd St., New York, N. Y.

WANTED
ALL SIZES
—CASING—
—TUBING—
&
—LINE PIPE—
Will Buy IN or ABOVE GROUND
State condition, Price and Location.
BOX B-100
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

WANTED 4½ x 5 or 6 Power Driven Mud Pump, also 2⅞ Drill Rod 10 or 12 ft. length. O. L. Kelly, 318 7th St., Elk City, Okla.

WANTED TO PURCHASE—one 10,000 and one 12,000 barrel cone top tank. Advise age, service and location. Box B-101, The Oil and Gas Journal, Tulsa, Okla.

For Sale—Equipment

FOR SALE—1875 new 4½" OD Seamless Pen V thread Casing Coupling. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

REFINERY EQUIPMENT—TOWERS—HOT OIL PUMPS
BUBBLE TOWERS—STABILIZERS—ABSORBERS—GRAY TOWERS

3′ to 8′ Diameter x 24′ to 74′ Height x ¼″ to ¾″ Shell Thickness, Riveted and Welded Reaction Chambers, 4″ and 5 3/16″ Thick, 4′ x 44′ and 5′ x 45′

3—24″ x 5″ x 24″ Worthington Hot Oil Pumps, Completely Reconditioned

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

ALL OR ANY PART—COMPLETE 2000 BBL. REFINERY

Bubble Tower 5′x52′x⅜″ — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½″ ID x 2 15/16″ OD x 20′ Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe — 5 Transport Trucks Good Tires.

THE PLAINS OIL & REFINING CORPORATION
GREAT BEND, KANSAS

FOR SALE: 9 miles of first class 3″ line pipe with recessed couplings, perfect threads, and standard weight line pipe. 20 miles 2″ line pipe, first class condition. The Interstate Pipe & Supply Company, P. O. Box 611, Marietta, Ohio.

FOR SALE: 1 Motor driven rotary drilling rig; suitable for 6,000 ft. work. Melton Supply Co., Seminole, Oklahoma.

NEW POWER UNITS
Four Caterpillar gasoline motors, new, 75 H.P. complete with governors, master clutch, carburetor, and magneto, not mounted, suitable for power unit; $395.00 each. O. C. Evans, Mt. Sterling, Ky.

FOR SALE: 125 H.P. 200 W.P. Broderick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FT. WORTH Spudder Super H, 2000′ machine, with or without tools. Priced right. O. B. Hausam, 4203 S. Madison, Phone 4-4288, Tulsa, Okla.

2800 FEET, 3½″ OD 13.30# Seamless Interior Upset Drill Pipe. All 21′ 9″ joints. Never drilled. Some tool joints. Current price, less 20%. Sorrento Petroleum Corp., American Bank Bldg., New Orleans, La.

TANKS: Three 100,000 and one 325,000 gallons; PIPING, VALVES, METERS, ETC. ON WATER FRONT IN PHILADELPHIA. Box A-992, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: 1 Askenia Type Magnetometer #7970, $750.00. Cities Service Oil Co., Bartlesville, Okla.—H. D. Patridge.

FOR SALE: 12 K.W. Portable Light Plant powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

50,000 FEET of 2″ 4.70# 10 V thread upset used seamless tubing.
FT. WORTH PIPE & SUPPLY CO.
Ft. Worth, Tex.

1—165 H.P. Type X Bessemer Direct Driven Gas Engine and Compressor, cylinder sizes to suit job. W. S. SMITH, 523 Thompson Bldg., Tulsa, Okla. Phone 2-5473.

FOR SALE
COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.
2—13 & 5½ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.
2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.
Used very little — excellent condition. Located on original foundation in Louisiana.

EARL E. KNOX COMPANY
Erie, Penna.

FOR SALE: At Oklahoma City, 2 85-HP, 175 lb. Oil Field Type Boilers, just shopped. $850.00 each. H. D. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Oklahoma.

FOR SALE

10,000′ 7″ O.D. 26# seamless casing.
5,000′ 7″, 24 lb. seamless casing.
5,000′ 2½″ seamless upset tubing.
300 sets 3″ tool joints, full hole.

Both steam and power drilling rig. A complete line of drilling and pumping equipment.

Wire, write, or phone the

Louisiana Iron & Supply Company
Shreveport, Louisiana

FOR SALE: At Bartlesville, two 40-gallon Soda and Acid "Ajax" Fire Extinguishers mounted on wood wheels. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Near Sasakwa, Okla., 1 Cooper Gas Engine, Type G-40, 400-HP, with or without Compressor Cylinders. Patridge, Cities Service Oil Co., Bartlesville, Okla.

I have sold second-hand alloyed once run Okla City Sucker rods to the largest independent oil producers in Kansas, Okla. & Texas, five producers have bought from 50 to 300,000 ft. all with good results. I am subject to call at anytime. I will dispose of the balance of ¾″, ⅞″ & 1″ in truck load lots delivered to your location on 60 days trial, for about half of new price. Your use subject to the approval of my engineer. Can also be used for pull rods. Six 2½″ x 7″ Guiberson tubing catchers and six 2½″ sucker rod overshots.

MIKE TRAVIS
1702 S. Boulder Tulsa, Okla.
Phone 2-2447

FOR SALE: 1 Wilson-Atlas Rig and Derrick, complete, with 2 225-HP Buda Engines. 4000 ft. 4½″ Drill Pipe. Condition A-1. Baldwin-Reed Drilling Co., 314 Waggoner Bldg., Wichita Falls, Texas.

BESSEMER Gas Engine & Compressor Type 8 50 HP and 80 HP d. c. units complete or in part. HTKS Magnetos, force feed lubricators, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE
OIL STORAGE TANKS
IN GOOD CONDITION

1—5,000 Bbl.
2—2,500 Bbl.
1—1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
2—1,200 Bbl. Agitators (prac. new)

Can be inspected at Middlesex Refinery Company, Raritan, N. J.

Address Your Inquires to

Dulien Steel Prod., Inc.
2280 Woolworth Bldg.
NEW YORK CITY, N. Y.
TELE. CORT. 7-4676

FOR SALE: 1—25 HP Westinghouse Sleeve Bearing Weatherproof type "CS" Electric Oil Well Pumping Motor. Serial #1134267; Class 3553; 3-phase; 60 cycle; 220/440 volt, 1150 R.P.M. Practically new. Box 390, Blackwell, Oklahoma.

FOR SALE
35 H.P. Superior Gas Engine and 16 foot Band Wheel Power. Condition A-1. The Geo. McGinley Supply Co., Bowling Green, Kentucky.

2—170 SQ. FT., 250# W.P. Southwestern Eng. Co. type Gas Coolers. One 16 pass on liquid, 4 pass on vapor; other 16 pass on liquid and 8 pass on vapor. W. S. SMITH, 523 Thompson Bldg., Tulsa, Okla. Phone 2-5473.

FOR SALE or RENT: 2—100 Ton Watson-Stillman Hydraulic Jacks. W. E. HAMMON, Ardmore, Okla.

4 x 6 FAIRBANKS Morse pump (new). 40′ 2″ Goodall rotary hose with Boss Couplings, (new). 2000′ 20′ used "N" rods, 1500′ 20′ used "PK" rods. Large and small roller bearing Crown Blocks, small water swivels. 4½ x 10 Gardner Denver Pump on skids powered by BTU Buda Engine. Large Sullivan Drill capable of drilling 3000′ slim holes or deeper coring. Priced to sell quickly. Box B-103, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Large quantity of Folded, Compressed Brake Lining suitable for Oil Well Machinery. Assorted widths and thickness, at very low prices. Samples and prices submitted upon request. Brake Lining Supply Co., Inc., 784 Commonwealth Ave., Boston, Mass.

FOR SALE: One No. 0 Star Water Well Drilling Machine, and 10,000 feet of 2″ second-hand tubing. A. B. Ayres, New Castle, Indiana.

FOR SALE: 1—4¾″ x 8″ National Transit vertical triplex single acting plunger pump; 1—Worthington 6 C.T.F., 8 twin, 2 stage steam jet evactor; 1—14″ x 24″ Roots-Connersville heavy duty removable sleeve bearing gas pump; 1—3″ ser. 150 Vogt motor operated valve, complete with controls; 1—3″, ser. 90 Vogt flanged valve S.S. trim. All in A-1 condition. Velsicol Corporation, 120 E. Pearson St., Chicago, Ill.

FOR SALE: No. 45 Star Spudder with calf reel and heavy duty mast, also complete sheer poles. 60 Caterpillar skid type power unit equipped for butane, also belt pulley. One medium size safety pulling machine—Good condition. THE VEEDER SUPPLY & DEVELOPMENT CO., P. O. Box 270, Cherryvale, Kansas.

ABSORBERS
2—72″ x 30, 15 tray, 75# W.P.
1—72″ x 30, 15 tray, 50# W.P.
1—60″ x 20, 15 tray, 100# W.P.
All Southwestern Engineering Co. Make
W. S. SMITH, 523 Thompson Bldg., Tulsa, Okla. Phone 2-5473.

FOR SALE: Improved Type Hydraulic Pipe Pulling Machine. George W. Davis R.F.D. #2, Muskegon, Michigan.

FOR RENT: Drilling rig (steam), derrick, etc. Fully equipped. Excellent condition. Capable to 9000′ economically. Cheap to rent. Prefer long period. Sorrento Petroleum Corp., American Bank Bldg., New Orleans, La.

FOR SALE—15,000 ft. used 4½″ OD 15# Seamless P.E. Pipe. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE AT McCOOK, NEBRASKA:
1—60 H.P., H. R. T. Bros Brothers Boiler.
KANSAS-NEBRASKA NATURAL GAS COMPANY, INC.
Hastings, Nebraska.

122 FT. Tubular Steel Derrick. Rent by month, or for sale. Double Eagle Refg. Co., D. L. Kelly, Okla. City. Tel. 2-9070.

HAVE remaining only 2500 feet 20″ O.D., ⅛″ Wall .35-.45 Carbon Steel Pipe P.E. in 50 ft. length good for low pressure line. Also Quantity Dresser Couplings, Ells and Valves. Subject to prior sale.

Write—Wire—Or Phone

BROWN-STRAUSS CORPORATION
Kansas City, Missouri

EIGHTY extra heavy 3½″ Key Headers, Jenkins Bubble Tower, Flash Tower, two Boilers and Settings, 2 Treating Towers, quantity of Valves and Fittings. Western Tank & Road Supply Co., Wichita, Kansas, or F. E. Reinhardt, General Delivery, Evansville, Ind.

FOR SALE: 2—steam rotary drilling rigs capable of drilling 4100 feet. Menke Estate, 603 Waggoner Bldg., Wichita Falls, Texas. Phone 3883.

REFINERY EQUIPMENT
From
RODESSA REFINERY, SHREVEPORT, LA.

ALLOY CRACKING TUBES—3½″ OD x 2⅝″ ID x 31′ 6″ long. 1¼% Chrome DM.
K4B HEADERS—Series 7000. 3½″ OD x 6¼″ Centers.

ALSO AVAILABLE FOR IMMEDIATE DELIVERY:

1—CRACKING CHAMBER—6′0″ x 65′ 4¼″ overall, self-supporting. Head and shell thickness 1 1/16″. Quadruple riveted, double strap butt joints. Seams and rivets welded inside and outside.
1—VAPORIZER—6′0″ x 34′0″ overall, self-supporting. Head thickness 1 1/16″. Shell thickness 1⅝″. Quadruple riveted, double strap butt joints. All seams and rivets welded inside and outside.

PUMPS, VALVES, FITTINGS, REFINERY SPECIALTIES, FRACTIONATING TOWERS, AND ABSORBERS.

WE SOLICIT YOUR INQUIRIES FOR ALL REFINERY EQUIPMENT

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At (Cedar Grove) Shreveport, La.
Phone 7-7334
Morton I. Glass, Resident Engineer

Main Office: Kansas City, Mo.
LD. Phone 169
Harry B. Strauss, Manager

Journalisms:

LETTERS are still coming in anent the editorial which was published in the April 30 issue of the Journal, in which it was urged that Mr. Ickes be elevated to a post with the War Production Board. We give you two more this week and then we'll call a halt.

William F. Humphrey, president, Tide Water Associated Oil Co., writes:

"The appointment of Petroleum Coordinator Ickes to the War Production Board should in my opinion, receive the hearty approval and endorsement of the petroleum industry because it would be for the best interest of every unit of that industry. In addition to his appointment as a member of the War Production Board, he should have, for the duration of the war, exclusive authority for the production, transportation, refining, and marketing of crude oil and petroleum products, and this definite authority should be vested in him by an executive order of the president of the United States or by an act of Congress, whichever may be appropriate and proper, so that his decisions on matters vitally affecting the petroleum industry would be final."

Henry D. Moyle, chairman of the refining committee of District 4, writes that "If the membership of Mr. Ickes on the War Production Board will expedite our war effort, then surely he belongs there."

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MUD is one of the problems common to all drilling operations, regardless of the locality. Companies and drilling contractors operating in shallow areas can get a great amount of good from reports of the practices in the deeper areas; foreign operators are benefited by reports on mud programs in United States wells and the reverse is also true.

In the near future, The Oil and Gas Journal will publish an article which describes the method by which the expense of materials for drilling fluid in wells in Trinidad, British West Indies, was greatly reduced. An interesting part of the method is the use of the pulp of citrus fruit as a viscosity-reducing agent.

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IN next week's issue the second and concluding installment of the articles on the maintenance of wire rope will be published. Proper inspection methods and the interpretation of conditions found during inspection will be presented. The two-article series on wire rope is only part of the material on the maintenance of drilling and production equipment scheduled for publication in Engineering and Operation Section in forthcoming issues of the Journal.

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FOR many years, the Journal has published each year an article on the composite financial statement of 32 leading oil companies. This article is prepared immediately after the annual reports have been issued, by F. J. Sansone, of Carl H. Pforzheimer & Co. Next week's issue will give the figures for 1941, and in most cases they are pleasant-sounding figures. Increased earnings were reported by all but two of the smaller members of the group. Six companies more than doubled their 1941 earnings. It is well, of course, to remember that this was last year, not this year.

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ANOTHER article of more than passing interest to gas, cycling and oil-production engineers will appear in an early issue of the Journal. The title of the piece is "Practical Application of Back-Pressure Tests to Gathering-System Problems." The authors are William Ferguson, associate natural-gas engineer, U. S. Bureau of Mines, Cryogenic Laboratory, Amarillo, Tex., and Milton F. Shaffer, gas engineer, Hagy, Harrington & Marsh, Amarillo.

The article deals with actual field problems and presents a method for determining graphically a curve to represent the producing ability of a system of wells and gathering lines. Ten working curves are presented to the readers.

CALENDAR

May

KENTUCKY OIL AND GAS ASSOCIATION, annual midyear meeting, Lexington, Ky., May 22.

WEST TEXAS GEOLOGICAL SOCIETY, spring field trip, vicinity of El Paso, Tex., May 23-24.

NATIONAL ASSOCIATION OF PURCHASING AGENTS (oil-company buyers' group), Waldorf-Astoria Hotel, New York City, May 25-28.

INDEPENDENT OIL MEN'S ASSOCIATION OF NEW ENGLAND, convention, Copley Plaza Hotel, Boston, Mass, May 26.

June

CANADIAN GAS ASSOCIATION, thirty-fifth annual meeting, Windsor Hotel, Montreal, Que., June 4-5.

ILLINOIS-INDIANA PETROLEUM ASSOCIATION, annual conference, combined with ILLINOIS BASIN CHAPTER, AMERICAN PETROLEUM INSTITUTE, annual meeting, Robinson, Ill., June 6.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

October

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

NATIONAL STRIPPER WELL ASSOCIATION, annual convention, Wichita, Kans., October 19.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.

November

AMERICAN PETROLEUM INSTITUTE, twenty third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

NATIONAL CHEMICAL EXPOSITION AND NATIONAL INDUSTRIAL CHEMICAL CONFERENCE, annual meeting, Stevens Hotel, Chicago, Ill., November 17-22.

December

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York City, November 30-December 4.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.

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